OLDER ADULT SUBSTANCE USE: AN ASSESSMENT OF CURRENT TRENDS, TREATMENTS, AND OUTCOMES

by

GREGORY LARKIN PURSER

(Under the Direction of Orion Mowbray)

ABSTRACT

Substance use rates and treatment need are increasing at a dramatic rate in the older adult population, due to new cohorts using substances longer in life and at higher rates than past cohorts, as well as a doubling in overall population size. Despite this, little is known regarding the physical, mental, and social health outcomes of prolonged older adult substance use or the most effective interventions. The first study in this dissertation examined substance use trends over 20 years using data from the 1994-2015 NSDUH. Results showed that substance use rates rose among all age groups, with older adults experiencing some of the largest increases. These results were then compared with past estimates, with use rates in 2015 already outpacing rates estimated for 2020. These findings provide further insight into the scope of the problem and areas that may require the most attention in the future. The second study examined the effect of problem drinking on feelings of loneliness and social support using structural equation modeling. Results indicate that problem drinkers had significantly higher feelings of loneliness and lower feelings of support than non-problem drinkers, possibly representing a need for additional focus in alcohol interventions incorporating the social needs of older adults. Finally, the third study included a scoping review of the effectiveness of brief alcohol interventions in reducing older
adult drinking levels, as well as a meta-analysis of these results. Overall, brief interventions appear to be effective at reducing drinking levels among older adults, however more high-quality studies using longer follow-up timeframes and diverse samples are needed.

INDEX WORDS: Older adults, substance use, alcohol, loneliness, social support, brief interventions
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DEDICATION

To the two that were always there for me - Carolin and Elia.

I could not have done this without you both.
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Chapter 1: Introduction and Literature Review

The year 2010 marked the first time individuals born in the cohort known as the “baby boomers” began to age into what is commonly defined as older adulthood, meaning 65 years of age and older. By 2015, all baby boomers were 50 years old and over. As a combined result of a large birth cohort and increasingly proficient medical care, the older adult population is beginning to reach all-time highs, both in total population and proportion. This surge in population size is predicted to bring with it numerous logistical problems for health and social service industries. One area that has been of concern for decades is the growth in older adult substance use, with both treatment need and use rates undergoing a significant increase (Arndt, Clayton, & Schultz, 2011; Gfroerer, Penne, Pemberton, & Folsom, 2003).

Statement of the Problem

Between 2003 and 2009, multiple research studies used recent data to project and estimate the future prevalence of older adult substance use rates, substance use disorders (SUDs), and treatment need for the year 2020 (Gfroerer, et al., 2003; Han, Gfroerer, Colliver, & Penne, 2009; Colliver, Compton, Gfroerer, & Condon, 2006). Since these predictions, little follow-up has been done to examine how older adult substance use rates are comparing as new data has come available. However, these studies portrayed an alarming picture of the future, with multiple measures of older adult substance use problems likely to experience 100% or greater increases. This is due in part to the overall population growth in older adult cohorts, but also a general increase in the proportion of individuals in older adulthood using substances at higher rates than
the past. This increase in use and treatment need presents many problems in need of solutions, but as the deadline nears there are still many questions left unanswered.

Older adults are at a particularly increased vulnerability to the effects of drugs and alcohol due to biological changes that occur as a person ages. This includes increased alcohol blood brain barrier permeability, decreased liver functioning and enzymes that process alcohol, and overall lower levels of water and higher levels of fat in the body (Blow, 1998; Vestal et al., 1977). All of these things combine to make a standard drink of alcohol potentially have a greater impact on a person’s blood alcohol content (BAC) when they are older. Many older adults also have chronic health problems such as hypertension, diabetes, and cancer that can be exacerbated by alcohol use (Mozaffarian, et al., 2009; Oslin, 2004). Additionally, older adults are also the most heavily prescribed group of people in the world as well as the largest consumers of non-prescription drugs, many of which have negative health interactions when taken with alcohol (Kantor, Rehm, Haas, Chan, & Giovannucci, 2015; Simoni-Wastila & Yang, 2006). Together these vulnerabilities mean that traditional measures of substance use problems may not cover all the potential dangers that substances can have on older adults and little research has been done regarding the negative social and physical health impacts of low-threshold alcohol use at-length in older adulthood, as well as few studies into the long-term impact of other substances such as marijuana, cocaine, and prescription drugs.

Despite all of this, older adults are the least likely to perceive a need for treatment and the least likely group to be screened for problem use (Choi, DiNitto, & Marti, 2004; Duru, et al., 2010). This is likely due to a combination of ageism, stigma, and lack of education, as well as limited time resources among physicians, who have been the most likely avenue through which older adults encounter a substance use screening. The Institute of Medicine has predicted that
baby boomers will add even more stress to “an already overburdened” healthcare system that is not properly trained, staffed, or educated to meet the incoming need (Institute of Medicine, 2008). Other potential sources for older adult screening and interventions exist outside of the healthcare system, such as through various social service agencies who have a large older adult clientele. However, little research has been done examining the readiness or effectiveness of these alternative resources.

**Study Purpose**

The increase in population, substance use rates, and substance use treatment need brought on by the incoming baby boomer cohort has been long foreseen, but health and social service agencies are not yet prepared to meet the larger demand. Older adults are at an increased vulnerability to problems resulting from substance use, but are also the least likely group to be screened for substance use problems. The changes in demographics, both in population size and rate of substance use, have resulted in an increased need for older adult substance use research. Older adults continuing to consume alcohol, prescription, and illegal drugs at higher rates and for longer periods of time is likely to result in physical and social health problems that have not yet been observed or understood. This leads to a need for further study into the health effects of substance use in older age, as well as a clearer plan for treatment for this population. To prepare health and social service agencies for these new challenges, a better picture of the problem, along with a better understanding of the efficacy of current solutions are needed. Therefore, the purpose of this dissertation is to provide up-to-date estimates of substance use rates and trends among older adults, examine potential impacts of this increased use, and review the effectiveness of current treatments.
Research Questions

This dissertation will utilize a three-study format, with each study examining a different aspect of the growing problem of older adult substance use. Because of this format, there will be separate research questions for each study. Together, these research questions aim to provide a basis for a research narrative that examines the growth of a problem, specific outcomes of the problem, and the effectiveness of our current solutions.

Study 1

1. What trends in substance use rates and treatment need can be observed among age groups in America over the past 20 years?
2. Which age groups have experienced the largest changes in substance use rates and treatment need?
3. How do these trends and current use rates among older adults compare to previous estimates?

Study 2

1. What effect does problem drinking have on older adults’ feelings of loneliness and support over time?
2. What demographic differences can be observed in the effect of problem drinking on older adult feelings of loneliness and support?

Study 3

1. What is the current scope of the evidence for the effectiveness of brief interventions in reducing alcohol use and risk-levels among older adult samples?
2. What differences, if any, exist among the effectiveness of differing settings and providers of brief interventions?
3. What is the overall effect size of brief interventions in reducing alcohol use and risk-levels among older adult samples?

**Theoretical Framework**

Much of the underlying theoretical framework for this study will be derived from the life course perspective, which was first formalized by Glen Elder (1976, 1994). Using data from two separate birth cohorts, one born prior to The Great Depression and the other after, Elder examined and theorized on the effect variables such as historic events and the timing of those events during a person’s life have on life outcomes, while accounting for individual agency in choice making. Because this dissertation is largely focused on the aging of the baby boomer cohort, the life course perspective provides a firm foundation for understanding why older adults born during this time period may have different substance use characteristics than those born before them.

The life course perspective has been previously used to help understand the substance use of individuals as they age (Hser, Longshore, & Anglin, 2007). Specific concepts drawn from the life course perspective that are applicable to older adult substance use include: transitions, life events, trajectories, and cohorts. A transition in the life course perspective is a change in role or status that is markedly different from previous roles (Elder, 1994). Transitions occur throughout the life course and may happen at the individual, family, or community level. An example of a transition that older adults may experience that could lead to a change in substance use is retirement, as it is likely to lead to a sudden increase in leisure time, loss of supportive social networks through work, and increased opportunities for drinking without consequence, which have been shown to relate to alcohol use (Wang, Steier, & Gallo, 2014; Zucker, 2000). Other
transitions likely to affect an older adult’s substance use include changes in health, residence, and caregiving roles.

A *trajectory* is a lengthy pattern involving both stability and change that encompasses multiple transitions (Elder, 1994; Hutchison, 2010). Trajectories exist for all aspects of an individual’s life, including their substance use. A substance use trajectory begins with a person’s first interaction with a substance and continues for the rest of their life, encompassing all the twists, turns, relapses, and reductions in use. Major changes in a trajectory are known as *turning points*, and involve a substantial change in a trajectory’s direction (Hutchison, 2010). Turning points typically spring from *life events*, which are smaller in scale but still involve a sudden change and can produce long lasting effects (Hutchison, 2010). A prominent example of an impactul life event for older adult substance use is the death of a spouse or loved one.

Finally, the concept of cohort is central to the scope of this study. The term cohort is used to distinguish and describe an “aggregate of individuals” who were born during the same historical time (typically defined by birth year) and therefore experienced historical events similarly (Settersten & Mayer, 1997, p. 235). The demographic characteristics of the baby boomer cohort help skew its drug and alcohol use rates. Baby boomers have higher levels of income, education, and leisure time which are all associated with higher alcohol use (Zucker, 2000). There are also a higher number of white and Latino males among the baby boomers, who have been shown to have higher drinking levels and lower treatment utilization (Duru et al., 2010; Wu, Kouzis, & Schlenger, 2003). On top of this, men are also catching up to women in life expectancy, meaning a larger portion of the oldest-old adults will be males, possibly increasing overall drinking rates in these age groups. However, men aren’t the only ones living longer, all
members of the baby boomer cohort are living longer on average than previous generations, which could mean larger health effects from past and continued substance use in this population.

The impact of history on the baby boomer cohort is also important in explaining the differences in drug and alcohol use rates between the incoming baby boomers and previous generations of older adults. Similar to how Elder’s early research observed the effects of The Great Depression on economic outcomes, the older adult population is currently composed of cohorts that were born during and after prohibition in America, which lasted from 1920 to 1933. The policies and cultural acceptance of drug and alcohol use have changed drastically from prohibition through to the 1960’s and ‘70s when the baby boomers were coming of age, and these changes have likely caused a large variance in drug and alcohol use rates among the different cohorts of older adults (Duncan, et al., 2010).

**Definition of Selected Terms**

*Older Adulthood*

Older adulthood can be defined and operationalized in many ways. Often, older adulthood is associated by government defined ages that coincide with retirement and pension availability. However, older adulthood can be understood as more than just chronological age and include changes in social roles and health. Studies included in this dissertation range in their chronological definitions of older adulthood from “50 and over” to “65 and over”. In general, studies will be considered to include an older adult sample if they define their sample as older adult, regardless of the chronological age cutoff.

*Alcohol Use*

Alcohol use includes any consumption of an alcoholic beverage within varying time periods. Measures of alcohol use may include lifetime use, use in the past month, average
number of drinks per week, or average number of drinks in a session. The National Institute on Alcohol Abuse and Alcoholism suggested guidelines for older adult alcohol consumption are no more than 3 drinks per day or 7 drinks per week.

_Illicit Drug Use_

Illicit drug use can be defined as the use of any substance that has been deemed illegal by the Drug Enforcement Agency (DEA) in America. For the purpose of this study, illicit drug use will mainly refer to marijuana and cocaine, as these are the two substances with large enough use samples in available older adult data for analysis. However, any illegal substance, including opioids, stimulants, hallucinogenic, and various other club and dissociative drugs, may potentially be use by older adults and is deserving of future research. Again, the operationalization of illegal drug use can include any use of the substance in the past month, the past year, or lifetime.

_Prescription Drug Misuse_

This dissertation will also examine the misuse of prescription drugs among older adults. In general, prescription drug misuse can be understood as using a medication prescribed by a doctor in any of the following ways: using a dosage of a medication that has not been recommended (e.g., taking too much), taking a medication for recreational purposes, or taking a medication that one has not been prescribed. Types of prescription medications include analgesics, tranquilizers, sedatives, and stimulants.

_Substance Use Problems_

Multiple types of substance use problems will be examined during this dissertation. The most standardized types of substance use problems are those set forth by the American Psychiatric Association (APA) in the DSM-5. This includes the catch-all term of Substance Use Disorder (SUD), as well as specific substance disorders for ten different types of substances:
alcohol, cannabis, cocaine, hallucinogens, sedatives, stimulants, opioids, anxiolytics, tobacco, caffeine, and other/unknown (American Psychiatric Association, 2013). These disorders are diagnosed by professionals and range from moderate to severe, depending on the number of criteria met. Additionally, as older adults may encounter problems from use without meeting the definition of an Alcohol Use Disorder (AUD), this dissertation will also examine harmful and problem drinking. Harmful and problem drinking refer to alcohol consumption that has already led to a health, social, or legal problem.

**Loneliness**

Loneliness is frequently defined as the discrepancy between the quantity or quality of relationships a person has and the quantity or quality they desire (Peplau & Perlman, 1979; Sermat, 1978). In addition, definitions of loneliness often also include symptoms of psychological distress that are due to this discrepancy (Young, 1982). Typically, all definitions of loneliness have three tenets in common: it results from a deficiency in social relations, it is solely subjective, and it is unpleasant.

**Social Support**

The definition of social support for this dissertation comes from Cobb (1976) and defines support as being composed of one or more of the following: 1) information leading a person to believe they are cared for and loved, 2) information leading someone to believe they are esteemed and valued, and 3) information leading someone to believe they belong to a network of communication which contains certain mutual obligations.

**Brief Interventions**

A brief intervention, also sometimes known as brief advice or by the specific technique of motivational interviewing, is an easily conducted and relatively short form of treatment or
intervention that is typically composed of an initial 10 to 15-minute session whereby an
interventionist provides personalized feedback regarding a person’s substance use, often based
on answers patients provided to a screening measures. This feedback session is often
accompanied by educational materials such as pamphlets, information about suggested use
guidelines, and some form of goal setting to reduce use.

Rationale and Significance of the Study

As mentioned, although the primary care physician and general healthcare system is
already overburdened in terms of financial and time resources, little research has been done
exploring the validity of alternative means of screening and treating older adult substance use.
This dissertation has the potential to provide an updated look on the growth of the older adult
substance use problem in order to better understand the state of the problem and the continued
direction of older adult substance use trends. This dissertation also aims to provide insight into
specific trends in substances so that further research attention can be designed to understand the
health impacts of the use and abuse of substances such as marijuana, cocaine, and prescription
drugs that have not traditionally been consumed in older adulthood but may now pose new health
threats. In addition, this dissertation will examine new outcomes that may be able to be
addressed alongside alcohol interventions and add understanding regarding the complex
relationship between alcohol and loneliness. Finally, this dissertation aims to provide the first
review of the validity of brief interventions for alcohol use among older adults through a scoping
review and meta-analysis, as well as examine the viability of its implementation in other settings
such as social work agencies.
Assumptions and Limitations

Because the data for this study is secondary, it must be assumed that the collection methods utilized by the researchers were rigorous and accurate and that the sampling of the NSDUH and NSHAP can provide accurate and generalizable information regarding the larger older adult population. It also must be assumed that respondents answered truthfully regarding their substance use habits. Another limitation related to this is the absence of biomarkers available to confirm participant’s substance use. The secondary nature of the data also means the researcher is limited in the types of variables and questions that they were able to examine. Additionally, it is also assumed that the chosen methodologies for each study are the best available to answer the research questions. Finally, a limitation specific to the third study in this dissertation is the use of only one researcher in conducting a scoping literature review.

Scope of the Study

This dissertation aims to examine issues central to older adult substance use, however its format of three studies and the diversity of its topics results in a relatively broad scope. The scope of the first study Recent Substance Use Trends Among Age Groups, is alcohol, marijuana, cocaine, and prescription drug use between 1994 and 2015. Although this period is somewhat limited, it encompasses a key time, since by 2015 all individuals born in the baby boomer cohort had reached the age of 50. This scope allows more accurate examination of the current problem when compared to projections made using data from 2002 (Colliver et. al., 2006) or 2006 (Han, et al., 2009). The scope of the second study is the changes over a 5-year period in a sample of older adults’ feelings of loneliness and support, and how problem alcohol use may be related. Finally, the scope of the third study is all brief interventions that have been conducted which reported specific results for older adult samples.
Overview of Studies

As mentioned prior, this dissertation will utilize a three-study format in order to meet its objectives. The first study will use data from two decades of the National Survey on Drug Use and Health (NSDUH) to examine substance use trends among different age groups in America in order to provide a more current understanding of changes in use rates among past and future cohorts of older adults. This will be done utilizing graphical representation of fitted linear regression lines portraying the direction of trends related to changes in alcohol, marijuana, cocaine, and prescription drug use, as well as treatment need, over time. Additionally, this chapter will examine the most recent available data on use rates among adults 50 and over in order to compare current rates with previously projected rates so that there can be an updated understanding of the state of the problem. The second study will look at the effect this higher rate of substance use may have on social outcomes for older adults, specifically how problem drinking impacts feelings of loneliness and support. It will do so by utilizing Waves 1 and 2 of the National Social Life, Health, and Aging Project to construct a structural equation model that aims to test the directional relationships of the variables. Finally, the third study will entail a scoping review of prior studies that have examined the efficacy of brief interventions among older adult populations, as well as a meta-analysis of the overall effect size of older adult brief interventions for alcohol use.
Chapter 2: Recent Substance Use Trends Among Age Groups

Introduction

The transition of the baby boomer generation, individuals born during the post-war period of 1946-1964, into older adulthood has been a highly speculated topic among many areas of research. A considerable amount of attention has been given to the potential increase in both older adult substance use and the need for substance use treatment (Arndt, Clayton, & Schultz, 2011; Gfroerer, Penne, Pemberton, & Folsom, 2003). Gfroerer and colleagues have predicted a 70% increase in the rate of substance use treatment need for older adults by 2020 (Gfroerer, et al., 2003), while separate analysis has shown that older adult substance use treatment need is increasing at a larger rate than younger adult groups, in particular for illicit drug use such as marijuana, cocaine, and heroin (Arndt, et al., 2011). However, both of these studies were conducted using data that was collected before a large portion of baby boomers had entered older adulthood. The purpose of this study is to further examine the changes in substance use trends, including use rates and treatment seeking, among the growing older adult population in order to better understand how the baby boomer cohort is likely affecting substance use rates among older adults so that health and social service agencies are better prepared to meet treatment needs.

Substance Use and Age

Substance use is not traditionally thought of as a problem affecting older adults. As with any misunderstanding, there are elements of truth to the idea that older adults do not have drug and alcohol problems. Substance use rates have been shown to be correlated with age, with use
usually peaking between 20 to 30 years of age, with a noticeable decrease occurring afterwards (Moore, et al., 2005). This drop in use can be attributed to a number of factors, many related to the increased number of responsibilities an individual takes on as they age further into adulthood, limiting their ability to consume substances; this is sometimes known as “maturing out” of substance use. Additionally, it has been thought that heavy substance users are likely to have a shorter lifespan, thereby reducing the number of people who sustain a substance use disorder into older adulthood.

Although use rates have typically declined with age, the growing older adult population faces serious threats from both an increased rate in overall substance use and treatment need, an increased vulnerability as a result of aging, as well as the logistical issues that occur when trying to provide services for a rapidly expanding group. Older adults are particularly vulnerable to the effects of drugs and alcohol, due to numerous biological changes that occur as a person ages, yet they are also the least likely group to be screened for substance use or to perceive a need for treatment (Choi, DiNitto, & Marti, 2014; Duru, et al., 2010). There are a number of reasons why doctors and health and human service workers might be less likely to screen older adults for substance use. The first is due to misconceptions previously mentioned, which is that many people do not think of older adults as potential substance users. This is a mindset that will need to be changed through education in order to prepare services that interact with older adults for the increase in treatment need that is occurring. Additionally, obstacles occur when screening older adults due to the misinterpretation of symptoms as other problems, such as cognitive impairment and falls.

Applying the life course perspective can help in understanding the changes in substance use that occur as individuals age (Elder, 1974; Elder, 1994). Substance use trajectories are often
affected by transitions that individuals experience as they age. For instance, the added responsibilities and roles that occur when people age such as employment and parenthood limit the amount and ability for a person to engage in substance use. Additionally, older adults experience unique life events and transitions that may lead to increased likelihood in reinitiating substance use. Older adults face changes in roles and responsibilities due to retirement and no longer needing to care for children which may provide more opportunity for substance use. Also, life events such as the death of spouses and friends may be factors in older adults choosing to engage in substance use as a means of coping. The life course perspective provides additional rationale for specific substance use trends among baby boomers as well, which will be discussed further in the following sections.

**Alcohol Use Trends**

A large portion of older adults born before the baby boomer generation either lived through or experienced the lingering effects of alcohol prohibition in America, which lasted from 1920 - 1933. Older adults born prior to 1945 were more likely to grow up in an environment with a greater negative opinion of alcohol than those born afterwards. This time-period effect is most noticeable when one examines the time period in which many baby boomers aged into peak substance use years, with the first wave of baby boomers turning 18 in 1963 and a large portion of baby boomers experiencing young adulthood in the height of drug experimentation in America, along with a growing acceptance of alcohol use. Because of this and other factors, cohorts born after WWII have been shown to have higher overall rates of heavy alcohol use than prior cohorts in America, while this cohort effect is not found in Western Europe or Australia, even though these areas experienced similar post-WWII population booms (DHHS, 2000; Lutz & Scherbov, 1999; Keyes, Li, & Hastings, 2011;).
Alcohol Use Disorders (AUDs) are the most common substance use disorders among both older adults and the general population in America, with around 16.1% of adults over 65 in 2007 meeting the qualification for an AUD at some point in their lifetime (Hasin, Stinson, Ogburn, & Grant, 2007), though this number is likely to rise as more baby boomers age into older adulthood. Around 1.5 – 4.2% of adults over 60 were diagnosed with a prior-year AUD (Hasin, et al., 2007; Substance Abuse and Mental Health Services, 2015), and the majority of older adults who seek treatment for a substance use disorder do so because of their alcohol use.

However, older adults do not have to meet the qualifications for an AUD in order to experience negative outcomes from alcohol consumption. Around 40% of older adults are current drinkers and it is likely that this proportion will increase in the near future (SAMHSA, 2015). Moore and colleagues conducted a longitudinal study of drinking habits that spanned 20 years and found that later cohorts of older adults (e.g. baby boomers and those after) experience a slower rate of decline in alcohol use than past cohorts (Moore, et al., 2005). This study also found that individuals who drank at heavier rates before reaching older adulthood had a significantly faster rate of decline in consumption than moderate drinkers. This is likely due to heavier drinkers experiencing more health problems as they age, requiring them to reduce their drinking.

It will be imperative that health and social service workers are aware of the negative health impacts that moderate alcohol consumption can have, as well as the correlates and risk factors of older adult risky drinking in order to ensure the incoming cohort of older adults receives its needed level of treatment. Alcohol drinkers who drink in moderation are reducing their alcohol consumption at lower rates than past cohorts of older adults. This is of particular concern because a person who was drinking within guidelines during their 50s may find
themselves engaging in at-risk drinking when they age into older adulthood if they do not change their drinking habits.

**Illicit and Nonmedical Prescription Drug Use Trends**

As previously noted, the baby boomer generation grew up during the height of illicit drug use in America. It was during the baby boomer’s young adulthood that President Richard M. Nixon first declared a national “war on drugs”, citing drug abuse as “public enemy number one” in 1971. Studies have shown that cohorts that had experience with substance use during youth are more likely to have substance use and associated problems in older adulthood (SAMHSA, 2000). Data on lifetime drug use rates has shown that the baby boomer generation has had significantly higher experience with illicit drugs than prior birth cohorts, with 49% of individuals born in the baby boomer cohort having used an illicit drug in their lives, compared to only 11% of people born prior to 1945 (SAMHSA, 1996). Additionally, at the turn of the century in 2000, 56% of people that will be 50 to 69 years old in 2020 had used an illicit substance in their lifetime (Gfroerer, et al., 2003).

This overall higher lifetime illicit drug use rate among baby boomers is predicted to have a significant impact on treatment need among older adults in the near future. Gfroerer and colleagues estimate that treatment need for illicit drug use among adults over 50 will increase by 500% between 1995 and 2020 (Gfroerer, et al., 2003). Over the ten years between 1998 and 2008, the number of older adults seeking substance use treatment for the first time nearly doubled, from 2.86% of all first-time treatment seekers to 4.42% (Arndt, et al., 2011). Although alcohol is still the leading substance that older adults seek treatment for, illicit drug use treatment need is growing at a faster rate among older adults than younger adults (Arndt, et al., 2011).
Prescription drug misuse is also a growing concern for older adult populations, and generally refers to any use of a prescription medication outside of its prescribed use. This includes taking a medication one is not prescribed, too much of a medication, or taking a medication for recreational purposes. Around 1 in 4 older adults have been prescribed psychoactive medications, such as opiates and benzodiazepines, which likely increases a person’s risk of misuse, abuse, and dependence (Simoni-Wastila & Yang, 2006). Emergency room visits and deaths from nonmedical prescription drug use have been rising in America and will likely disproportionately affect future older adult populations (Simoni-Wastila & Yang, 2006). Older adults also face an increased risk from prescription drug misuse in the form of alcohol-medication interactions. Around 77% of all older adult prescription drug users have a prescription for an alcohol-interactive (AI) drug, and 19% of those individuals reportedly consume alcohol while on an AI medication (Pringle, Ahern, Heller, Gold, & Brown, 2005). More older adults are also using alcohol as a means of pain management, greatly increasing their likelihood of alcohol-drug interactions and alcohol use disorders (Aira, Hartikainen, & Sulkava, 2008; Moos, Brennan, Schute, & Moos, 2010). When all vulnerabilities are considered, including biological changes, negative health comorbidities, and drug interactions, many older adults face serious threats to health from even small amounts of alcohol consumption.

**Methods**

Data for this study come from multiple iterations of the National Survey on Drug Use and Health (NSDUH), spanning from 1994 to 2015. The NSDUH is a nationwide survey that takes place every year and is funded and supervised by the Substance Abuse and Mental Health Services Administration and carried out by RTI International. The main goal of the NSDUH is to collect annual data on the use of tobacco products, alcohol, illicit drugs (including prescription
medications), and mental health of individuals across the country aged 12 and older in order to assess the consequences and risk factors associated with their use. Households are randomly selected and participants are interviewed in their homes, with the majority of the survey being answered privately on a laptop. All responses to the survey are confidential and data files are identified only by a code number. Sample sizes for the survey experienced a large increase after 1998. Between 1994 and 1998, sample sizes ranged from n=17,747 to n=25,500 (mean=20,766 SD=3888.58). Sample sizes ranged from n=53,560 to n=58,397 (mean=55,694.6, SD=1,411.84) between 1999 and 2014, with 2015 seeing a large boost in sample size to n=114,292. This resulted in an overall mean sample size of n=50,168.62 with a standard deviation of 21,190.58. Sampling design was changed in 1999 and further improved in 2002 in order to allow an independent, multistage area probability sampling of all 50 states. In addition, starting in 2002 the survey was officially renamed from the National Household Survey on Drug Abuse to NSDUH and respondents began receiving a $30 compensation for participating in the survey. Although many questions have been reworded and added over the 20 year time-frame of this data, the questions used in this study remained relatively consistent throughout with only minor alterations.

Measures

Alcohol Use Days

Alcohol use days was a continuous variable ranging from 0-30, measuring the number of days in the past month that a respondent had consumed alcohol. The variable was operationalized by respondents answering the following question: “During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverages?”.
Binge Drinking Days

Binge Drinking Days was a continuous variable ranging from 0-30, measuring the number of days in the past month a respondent had engaged in binge drinking. The variable was operationalized by respondents answering the following question: “During the past 30 days, on how many days did you have five or more drinks on the same occasion?”

Any Alcohol Use (Past Month)

Any Alcohol Use was a binary variable created from Alcohol Use Days. All respondents who had reported having consumed alcohol on one or more occasion in the past month were coded as “1”, and those that had reported no drinking days in the past month were coded as “0”.

Any Binge Drinking (Past Month)

Any Binge Drinking was a binary variable created from Binge Drinking Days. All respondents who had reported having consumed 5 or more alcoholic beverages on one or more occasion in the past month were coded as “1”, and those that had reported no binge drinking days in the past month were coded as “0”.

Marijuana Use Days

Marijuana Use Days was a continuous variable ranging from 0-30, measuring the number of days in the past month that a respondent had used marijuana. The variable was operationalized by respondents answering the following question: “During the past 30 days, on how many days did you use marijuana or hashish?”.

Any Marijuana Use (Past Month)

Any Marijuana Use was a binary variable representing any use of marijuana by the respondent in the past month. The variable was operationalized by respondents answering the question: “How long has it been since you last used marijuana or hashish?”. Answers were then
coded in the NSDUH as either “Within the past 30 days”, “More than 30 days ago, but within the past 12 months”, “More than 12 months ago”, and “Never used marijuana”. The variable was then recoded to dichotomize it into “Used within the past 30 days” (1) and “Did not use within the past 30 days (0).

Any Cocaine Use (Past Month)

Any cocaine use was a binary variable representing any use of cocaine in the past month. The variable was operationalized by asking respondents: “How long has it been since you last used cocaine?”. Answers were then coded in the NSDUH as either “Within the past 30 days”, “More than 30 days ago, but within the past 12 months”, “More than 12 months ago”, and “Never used marijuana”. The variable was then recoded to dichotomize it into “Used within the past 30 days” (1) and “Did not use within the past 30 days (0).

Any Non-Medical Prescription Drug Use [NMPDU] (Past Month)

Any NMPDU was also a binary variable representing any use of nonmedical prescription drug use in the past month. Nonmedical prescription drug use included taking a medication that was not prescribed to the respondent or taking a medication for recreational purposes. Medications included pain relievers, tranquilizers, sedatives, and stimulants. Respondents were asked: “How long has it been since you last used any prescription pain reliever/tranquilizer/sedative/stimulant that was not prescribed for you or that you took only for the experience or feeling it caused?”. Possible answers included “Within the past 30 days”, “More than 30 days ago, but within the past 12 months”, “More than 12 months ago”, and “Never”. Dichotomous variables were created for each class of prescription drug, with use in the past 30 days coded as “1” and all else coded as “0”. Then, all four variables were summed for each respondent and then recoded with 1 or more as “1” and zero as “0”.
Treatment Utilization (Past Year)

Treatment Utilization was a binary variable representing any use of a substance abuse treatment program in the past year. Respondents were asked: “During the past 12 months, … have you received treatment or counseling for your use of alcohol or any drug, not counting cigarettes?”. Positive responses were coded as “1” and negative responses were coded as “0”.

Demographic and Other Variables

Demographic variables for this study included age, gender, race, and marital status. Age was recoded into categories: 12-17, 18-25, 26-35, 36-49, and 50+. To simplify graphical interpretation, the 12-17 group was not included in analysis. Gender was a dichotomous variable (Male, Female). Race was coded into four categories: Non-Hispanic White, Black, Hispanic, and Other. Marital status was also coded into four categories: Married/living together, Divorced/Separated, Widowed, and Never Married.

Analysis

All analyses were performed using Stata v12 (StataCorp, 2011). Descriptive properties and missingness were first examined for all variables. Missingness was handled using list-wise deletion. Trend summaries were rendered graphically, with X-axis representing years and Y-axis representing each respective drug use measurement (days, percentage used in past month). Trend summaries consisted of fitted regression lines representing the direction and rate of change in substance use over time among the four categories of age groups as well as bar graph comparisons between 1994 and 2015. More detailed trend graphs were created for the older adult groups which included observed data lines imposed over fitted regression lines with 95% confidence intervals. Pearson’s correlation coefficients were examined for each category of substance use and year for each age group.
Additionally, data from the most recent NSDUH was used to compare current substance use data with previously projected data. Colliver and colleagues (2006) and Han and colleagues (2009) published studies projecting the effect of increased substance use among the baby boomer generation and provided estimates for use rates and past year SUD rates for the year 2020. Han and colleagues used a portion of the same data as this study, NSDUH years 2002 to 2006, to generate their estimates. Data from the 2015 NSDUH was examined for each of the categories the authors had calculated and used to compare.

**Results**

Table 1 presents the substance use and demographic characteristics for the NSDUH samples from 1994 to 2015 in five-year intervals. Overall the sample was 52.51% female with the majority of the sample identifying as Non-Hispanic White (62.23%). Older adults on average were 55.31% female and 75.68% Non-Hispanic White. The representation of older adults in the sample grew over time from just 5.7% of the sample in 1994 to 15.3% in 2015. On average, 61.19% of older adults in the sample were married or living with a partner, with 17.25% divorced or separated, 14.96% widowed, and 6.60% never married.

**Alcohol Use Trends**

Figure 2.1 shows the fitted regression lines for the changes in percentage of individuals who had consumed alcohol in the past month for each age group, while Figure 2.2 displays this change in a bar graph comparing 1994 alcohol use rates to 2015 rates. The older adult age group saw the largest growth in this category, with a total increase of 22.2% from 1994 to 2015.
Figure 2.1: Any Alcohol Use Percentage Fitted Regression

Figure 2.2: Alcohol Use in Past Month: 1994 & 2015
Table 2.1: Five-Year Sample Characteristics

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<tr>
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<td>11.6 11.1 9.9 6.8</td>
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Both the 26 to 34 and 35 to 49 age groups experienced modest growth relative to the older adult group, with a total increase of 5.5% and 6.9%, respectively, while the 18 to 25 age group remained relatively stable over the 21 years. Additionally, Pearson’s correlation coefficient was estimated for year and alcohol use among each age group, and all age groups had significant positive correlations except for the 18 to 25 age group.

Figure 2.3 shows the fitted regression line for each age group’s trend in average number of days in the past month a person had consumed alcohol. All age groups showed a positive trend in alcohol use days and Pearson’s correlation was significantly positive for each group. Figure 2.4 provides a more detailed graphing of the changes in use days for the older adult group, with both observed data in the form of a line graph, along with fitted regression lines with confidence intervals.

The older adult group again showed the highest change in percentage of individuals who had engaged in binge drinking in the past month, with a growth rate of 100% between 1994 and 2015. This was followed by an 80.3% increase among 35 to 49 year olds, a 51.6% increase among 26 to 34 year olds, and a 20.9% increase among 18 to 25 year olds. Figure 2.5 shows the percentage differences between 1994 and 2015, while Figure 2.6 shows the fitted regression line for percentage of binge drinkers in past month. All age groups except for the 18-25 group showed a positive correlation between binge drinking days and all age groups had a significant correlation between year and any past month binge drinking. Figure 2.7 shows a more detailed graphing of the changes in the percentage of binge drinkers for the older adult group, with both observed data in the form of a line graph, along with fitted regression lines with confidence intervals.
Figure 2.3 - Alcohol Use Days Fitted Regression

Figure 2.4 - Observed and Fitted Trend for Alcohol Use Days: 50+
Figure 2.5- Binge Drinking in Past Month: 1994 & 2015

Figure 2.6- Percentage Binge Drinking Fitted Regression
Additionally, Figure 2.8 shows the fitted regression lines for each age groups’ trends in number of days in the past month respondents engaged in binge drinking, while Figure 2.9 shows a more detailed graphing of the changes in the binge drinking days for the older adult group.

**Illicit Drug Use Trends**

Figure 2.10 shows the changes in percentage of individuals who had used marijuana in the past month. As the graph shows, past-month marijuana use has risen for all age groups, with the largest percentage change by far occurring in the 50 and over age group, which saw an increase of 375%. Additionally, the 35 to 49 age group saw an increase of 90%, the 26 to 34 group an increase of 57%, and 18 to 25-year-olds an increase of 44%. These trends are displayed in fitted regression lines in Figure 2.11 and all age categories had a significantly positive correlation between marijuana use and year. See Figure 2.12 for a more detailed graphing of the changes in the percentage of marijuana users for the older adult group.
Figure 2.8- Binge Drinking Days Fitted Regression

Figure 2.9- Observed and Fitted Trend for Binge Drinking Days: 50+
Figure 2.10 - Marijuana Use in Past Month: 1994 & 2015

Figure 2.11 - Marijuana Use Fitted Regression Line
Marijuana use days for all age groups are displayed in Figure 2.13, while a more detailed graphing of the changes in marijuana use days for the older adult group, with both observed data in the form of line graph, along with fitted regression lines with confidence intervals, is shown in Figure 2.14. In contrast, cocaine use in the past month (Figure 2.15) is the sole measure of substance use in this study that showed a consistent decrease in percentage from 1994 to 2015 across groups, except in the 50 and over age group which increased by 50%. However, this measure is likely unreliable as group sizes were too low, with an average of only 2 individuals in the positive use category from 1994 to 2000, though this number did increase to 60 by 2015. Cocaine use in the past month decreased by 33% in the 18 to 25-year-old group, 53% in the 26 to 34 group, and 40% in the 35 to 49 age group. This trend is displayed as a fitted regression line in Figure 2.16.
Figure 2.13- Marijuana Use Days Fitted Regression

Figure 2.14- Observed and Fitted Trend for Marijuana Use Days: 50 +
Figure 2.15: Cocaine Use in Past Month: 1994 & 2015

Figure 2.16: Cocaine Use Fitted Regression
Prescription Drug Misuse Trends

Figures 2.17 displays changes in the misuse of any prescription drugs in the past month between 1994 and 2015. All four age groups saw triple digit percentage increases: 257% in the 18 to 25 age group; 157% in 26 to 35 age group; 167% in the 36 to 49 age group; and 200% in the 50 and over age group. All four age groups also had significant positive correlations between prescription drug misuse and year. Additionally, Figure 2.18 shows the fitted regression trend line for all age groups and Figure 2.19 shows the observed data line for each year with the fitted regression line imposed for the 50 and over group.

Substance Use Treatment Utilization Trends

Finally, Figure 2.20 shows the changes in treatment utilization in the past year between 1994 and 2015. As expected with increasing substance use rates, past-year treatment utilization rates have also increased over the 20-year period. Treatment utilization rates increased 100% in the 18 to 25 age group, 56% in the 26 to 35 age group, 58% in the 36 to 49 age group, and 800% in the 50 and over age group. These trends are displayed as fitted regression lines in Figure 2.21. All four age groups had significant positive correlations between treatment utilization and year. Additionally, Figure 2.22 shows a more detailed graphing of the changes in treatment need for the older adult group, with both observed data in the form of line graph, along with fitted regression lines with confidence intervals.
Figure 2.17 - Nonmedical Prescription Drug Use in Past Month: 1994 & 2015

Figure 2.18 - Nonmedical Prescription Drug Use Fitted Regression
Figure 2.19- Observed and Fitted Trend for NMPDU: 50+

Figure 2.20- Treatment Utilization in Past Year: 1994 & 2015
Figure 2.21 - Treatment Utilization Fitted Regression

Figure 2.22 - Observed and Fitted Trend for Treatment Need: 50+
Comparison with Projections

Recent older adult substance use rates were also compared with earlier predictions, namely projection studies conducted by Colliver and colleagues (2006) and Han and colleagues (2009). Both studies utilized the same data as this current study, with Colliver drawing projections based off of 1999 - 2002 of the NSDUH and Han using the 2002 - 2006 NSDUH. Colliver’s measures of projection included percentage of adults 50 and over in 2020 who will have used marijuana and misused prescription drugs (sedatives, tranquilizers, stimulants, and analgesics) in the past year, while Han’s projection estimates focused on the percentage of adults 50 and over in 2020 who will have developed a substance use disorder (SUD).

Although Colliver projected that 2.9% (SE: 0.7) of older adults will have used marijuana in the past year by 2020, rates from the 2015 NSDUH show that this estimation has already been surpassed, with 6.3% (SE: 0.26) of adults 50 and over in the sample having used marijuana in the past year. Colliver also projected that 2.4% adults 50 and over will have misused prescription drugs in the past year, while data from the 2015 NSDUH show that already 3.7% (SE: 0.20) misused prescription drugs in the past year. Additionally, Han’s projections estimate that by 2020, 4.9% (SE: 0.31) of older adults will have had a past-year SUD, having risen from 3.6%. In the 2015 NSDUH sample, the number of older adults with a past-year SUD had risen to 4.2% (SE: 0.21), requiring a 16.7% growth in 5 years to meet Han’s projections.

Discussion

Results from this study suggest that all age groups in America have increased their overall substance use rates over the 21 years from 1994 to 2015. Although alcohol measures saw consistent growth in the older adult population, the largest growth came from marijuana and prescription drugs. Results support the theory that the traditional decline in substance use that
occurs as a person ages is happening at a decreased rate among baby boomers and suggest an alarming trend towards a potentially enormous growth in the need for substance use treatment, both due to the decline in abstinence and the overall population growth. This study also indicates that for many substance use measures, specifically marijuana and prescription drug misuse, older adults are already using at higher rates in 2015 than were predicted for 2020, with the projection for past-year SUD appearing to be on track.

If this trend of surpassing projections continues, it is likely that there will be an over 150% increase in the need for older adult substance use treatment (Gfroerer, et al., 2003), yet little preparation appears to be made to meet this large increase in need. Only around 18% of treatment facilities in 2011 had treatment programs specifically for older adults, and only a quarter of the facilities that had an age-specific program were accredited (Morgen, Denison-Vesel, Kobylarz, & Voelkner, 2015; Rothrauff, Abraham, Bride, & Roman, 2011). This increase in treatment need is likely to overwhelm an already overburdened healthcare system, with primary care physicians (PCP) currently being the most likely avenue through which a substance use problem is detected (Blow & Barry, 2012). Efforts will need to be made to increase the size of the screening network in order to sufficiently meet the increased treatment need, as older adults are currently the least likely age group to perceive a need for treatment or be screened for treatment (Choi, DiNitto, & Marti, 2014; Duru, et al., 2010). However, little research has been done examining the effectiveness of screening and brief intervention outside of a PCP setting.

Previous analysis of substance use treatment needs has predicted the largest increase in need among cocaine and heroin users, with first-time treatment seeking for alcohol use only showing a steady decline in comparison (Arndt, 2011). However, results from this study indicate a consistent upwards trend in binge drinking days, percentage of binge drinkers, and alcohol use
days among older adults. It’s possible incoming cohorts of older adults are less likely to perceive a need for alcohol treatment or understand their use rates as being problematic and should be examined in the future.

As noted, the largest increase in use among the NSDUH occurred in past-month marijuana use. With the increasing legalization in America, with 9 states permitting recreational use at the time of this study, understanding the effects of cannabis use in older adulthood is a pertinent and urgent matter. Frequent reasons for self-medication among older adults include pain management and insomnia, which are often believed to be benefits of marijuana use. This, along with the fact that baby boomers have more free time and expendable income than past generations and are also much more likely to have tried marijuana in their lifetime, will likely fuel a continuation in the trend observed in this study as more baby boomers enter retirement and incur health problems.

**Limitations**

The results from this study indicate alarming increases in substance use, however there are a number of limitations that must be considered. Although data from the NSDUH are longitudinal and able to provide insight into substance use trends in America over time, each time point is composed of cross-sectional data. This means it is possible some of the trends and changes in use are due in part to sampling error and do not represent as strong of a maintained increase in substance use levels as observed. Additionally, although this study is able to examine trends of substance use over the past two decades, its methods have little ability to predict whether these trends will continue. It is possible that a large cohort effect exists which is driving the increase in substance use rates that may or may not resolve and regress to the mean when other younger cohorts age into older adulthood. However, the large increase in population and
use rates occurring now means increased attention and treatment efforts are needed regardless of the permanence of the changes.

**Implications and Conclusion**

Older adults are consuming alcohol, prescription and illegal drugs at higher levels than ever before, with 2015 rates for marijuana and prescription drug misuse already exceeding projections for 2020. Although these changes in substance use rates among older adults have been foreseen for decades, health and social services are underprepared to meet the increase in screening and intervention need. Additionally, relatively little is known regarding the long-term effects of continued substance use throughout older adulthood. As new cohorts of individuals enter older adulthood and continue to maintain their substance use rates, America is likely facing unclear consequences of substance use. Problem use of substances like cocaine, marijuana, and prescription medications among older adults have been relatively non-existent in the past but are becoming more common, leading to a large increased need for research into what these uses at differing levels mean for healthy aging.
Chapter 3: Social Outcomes of Problem Drinking

Introduction

There exists a complex and poorly understood relationship between alcohol and social isolation, including the feelings of loneliness and support. Loneliness is often cited in literature as a reason for older adult alcohol use and has been distinguished as a focus of older adult specific alcohol treatment (Blow, 1998; Schonfeld & Dupree, 1991). In opposition to this, recent research has also shown that frequency of alcohol consumption is related to lower feelings of loneliness in older adults, though this is likely due in part to the social aspects of drinking (Canham, Mauro, & Kaufmann, 2015; Canham, Mauro, Kaufmann, & Sixsmith, 2016). However, no studies have examined the longitudinal effect on older adult’s feelings of loneliness and support when alcohol is consumed at problem levels. Therefore, the purpose of this study is to observe the effect problem drinking has on levels of loneliness and social support over time.

Older Adults and Problem Drinking

The population of older adults in America is experiencing a rapid growth, with numbers expected to double between 2010 and 2050 (Vincent & Velkoff, 2010). Along with this population growth, both the prevalence of alcohol consumption and the need for alcohol treatment is on the rise among older adults, in part due to the generation known as the baby boomers aging into this group, bringing with them higher lifetime and current rates of alcohol use (Arndt, Clayton, & Schultz, 2011; Blow & Barry, 2012; Gfroerer, Penne, Pemberton, & Folsom, 2003). About half of all current older adults have consumed alcohol in the past month
(SAMHSA, 2015), with around 1.5 – 4.2% of adults over 60 diagnosed with a prior-year AUD (Hasin, et al., 2007; Substance Abuse and Mental Health Services, 2015).

Due to biological changes that occur as a person ages, such as decreased water in the body, increased body fat, livers that are less efficient at processing alcohol, and increased blood-brain permeability, the same amount of alcohol is likely to have an increased effect on a person’s blood-alcohol levels in older adulthood (Blow, 1998; Vestal et al., 1977). Because of this, drinking guidelines are modified for older adults, with the NIAAA recommending no more than 3 drinks per day or 7 drinks per week for healthy older adults who do not take potential alcohol-interactive medications (NIAAA, 2005). Due in part to these biological changes, an AUD is not necessary for an older adult to experience problems from consuming alcohol. Other categories of drinking that may not qualify for an AUD but present possible harm for older adults include at-risk drinking, binge drinking, heavy drinking, and problem drinking.

At-risk drinking refers to drinking alcohol above the recommended guidelines. Binge drinking typically refers to having 5 or more drinks in a session, as this is the average amount of alcohol needed to raise a person’s blood alcohol content (BAC) to .08. However, because older adults are less efficient at processing alcohol, this threshold may be reached at fewer drinks. Finally, problem drinking, also sometimes called harmful drinking, refers to alcohol use that has led to undesirable consequences or harm (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Blow & Barry, 2012; Whitlock, Polen, Green, Orleans, & Klein, 2004). Such consequences may be related to relationships, employment, the legal system, or a person’s health.

Drinking guidelines for older adults also include important caveats regarding the various conditions that are more common in older adulthood that can exacerbate alcohol’s effects on the body. Guidelines specify that they are meant for healthy older adults because many health
problems are impacted by alcohol use, such as heart disease, diabetes, and some cancers.

Medication interactions are also a serious concern for older adult drinkers. The older adult population in America has the highest rates of both prescription and over the counter drug use (Kantor, Rehm, Haas, Chan, & Giovannucci, 2015; Simoni-Wastila & Yang, 2006). Studies have shown that 19% of older adults consumed alcohol even when they were taking a medication that negatively interacts with alcohol (Pringle, Ahern, Heller, Gold, & Brown, 2005).

These exceptions to drinking guidelines for older adults bring to attention the added risks and vulnerabilities older adults face when consuming alcohol. Because even relatively small amounts of alcohol can have significant physical, mental, and social effects for older adults, it is better to examine older adult alcohol issues relative to the individual. Instead, problem, hazardous, or harmful drinking provide a good measure for this purpose as these terms are not solely based on numerical units of alcohol consumed but instead the effects the alcohol use is having on a person’s life.

Problem drinking for older adults is correlated with male gender, younger age in older adulthood, and fewer health problems (Merrick, et al., 2007) and has been shown to be associated with numerous undesirable outcomes, including hospitalizations, falls, cognitive impairment, medication interactions, insomnia, and suicide (Clark, Samnaliev, & McGovern, 2009; Kist, Sandojo, Kok, and van den Berg, 2014; Korrapati & Vestal, 1995; Sorock, Chen, Gonzalgo, & Baker, 2006). Due to the growing number of older adults likely to engage in problem drinking, and the decreased likelihood of screening associated with older age (Duru, et al., 2010) a better understanding and attention to screening is needed. Additionally, although the physical health impacts of problem or harmful drinking are receiving attention in research, the social impacts of drinking among older adults are still convoluted and poorly understood.
Loneliness and Older Adults

Loneliness is frequently conceptualized as the discrepancy between the quantity or quality of relationships a person has and the quantity or quality they desire (Peplau & Perlman, 1979; Sermat, 1978). In addition, definitions of loneliness often also include symptoms of psychological distress that are due to this discrepancy (Young, 1982). Typically, all definitions of loneliness have three tenets in common: It results from a deficiency in social relations, it is solely subjective, and it is unpleasant.

The deficiency in social relations does not have to be the number of social contacts. This key detail is what separates loneliness from the similar condition of social isolation. Whereas loneliness is a purely subjective experience and can be felt for a variety of reasons, social isolation is an objective measure of the number of ties and contact, or lack thereof, that a person has. Loneliness’ subjective nature makes it near impossible to measure in any objective way. For instance, a person surrounded by a crowd of people may feel lonely, while a hermit by himself may not feel lonely at all.

Loneliness is a common phenomenon that can manifest throughout a person’s life and has a large variance in its duration, with some experiencing loneliness for as short as a day, while others may continuously feel lonely for years. Older adults have often been thought to be lonelier than younger populations, with people surveyed among the general public frequently naming loneliness as a serious problem for older adults (Abramson & Silverstein 2006). This belief appears to be just a myth, as research has shown that on average most adults over 65 experience loneliness at similar levels to other adults, with around 20 to 35% of persons aged 25 to 79 feeling moderate or serious loneliness (Dykstra, 2009). Interestingly, loneliness appears to
present along an age U-curve, with the highest levels of loneliness felt among teenagers and adults 80 and older.

Perlman and Peplau suggest that risk factors for loneliness can be grouped into two categories: events and predispositions (1979). The first category of risk factors can be understood well with the concepts of transitions and life events from the life course perspective (Elder, 1974; Elder, 1994). Combining these perspectives, one can understand loneliness in older adulthood as a result of changing social desires or needs that come about from life events and transitions. Events that are unique or more common to older adults that may trigger loneliness include the death of a spouse or friends and declining health, as well as a variety of ways social contact can be reduced, such as retirement and lowered mobility. Predispositions to loneliness refers to innate or learned behaviors and attributes that may increase a person’s chances of experiencing loneliness. These have been found to include a shy or introverted personality, poor social skills, and lower self-esteem.

General risk factors for loneliness include female gender, poor health, low functionality, poorer health than one expected, increased time spent alone, and marital status (Victor, et al., 2005; Dykstra, Tilburg, & Gierveld, 2005). Older adults who experience the death of a spouse have been shown to have the most significant increases in loneliness in longitudinal studies (Dykstra, et al., 2005). Marital status also appears to moderate the level at which older adults benefit from different types of contact, with adult children, sibling, and neighbor contact benefiting divorced, widowed, and never married individuals more (Pinquart, 2003). Additionally, better functional status was shown to significantly correlate with lower loneliness in widowed, divorced, and never married older adults but not married ones. Marital status also
appears to affect gender differences in loneliness, with unmarried men showing higher levels of loneliness than unmarried women (Pinquart, 2003).

Although many older adults experience an increase in loneliness as they age, it is not a necessary condition. Education level has been found to be a general protective factor for loneliness (Victor, et al., 2005). Both improvement in functional status as well as expansion in social network size have been shown to result in lower feelings of loneliness (Dykstra, et al., 2005). Social media use may also have an impact on older adult’s feelings of loneliness, with frequent users of passive and direct communication on Facebook found to have lower levels of loneliness than infrequent users (Hutto, et al., 2015).

Studies have shown that loneliness has a significant impact on morbidity risk, with cardiovascular health and blood pressure being specifically affected (Caspi, Harrington, Moffitt, Milne, Poulton, 2006; Thurston & Kubzansky, 2009). Additionally, loneliness has been shown to correlate with overall increased mortality risk (Shiovitz-Ezra & Ayalon, 2010). Depression has also frequently been correlated with loneliness. Although they are distinct conditions, loneliness and depression share many of the same symptoms, bringing attention to the difficulty in differentiating between behaviors and conditions that cause loneliness and those that are a result of loneliness, as well as behaviors that simply coincide with loneliness.

Social Support and Older Adults

Social support is a concept that begins at the start of life. Humans advance through different levels and avenues of social support as they age, beginning with parents and siblings and expanding outward to include varying networks of people and animals. Social support has been defined as being composed of one or more of the following: 1) information leading a person to believe they are cared for and loved, 2) information leading someone to believe they are
esteemed and valued, and 3) information leading someone to believe they belong to a network of communication which contains certain mutual obligations (Cobb, 1976). People may receive social support from any combination of the aforementioned categories from a large variety of sources, with the source of support likely affecting its impact. These categories of support can also be further broken down as either tangible support, meaning measurable assistance from other individuals, or emotional support.

Support has been linked to the etiology of many forms of physical and psychological illnesses (Cohen, 1988). Increased social roles and perceived support have been shown to be related to better pulmonary, coronary, and endocrine health as well as an overall better immune system and higher level of functioning (See Uchino, Cacioppo, & Kiecolt-Glaser, 2006 for review). Individuals with higher levels of social support have also been shown to be happier and have higher levels of self-rated well-being, as well as lower rates of mortality (Penninx, et al., 1997; Myers, 2000). Depression and loneliness have been shown to be correlated with social support, with social support in older adults possibly acting as a buffer in the effect depression has on life satisfaction (Adams, King, & King, 1996). Additionally, social support has been shown to influence health behaviors such as likelihood in exercising and medical regime adherence (Dimatteo, 2004; Resnick, Orwig, Magaziner, & Wynne, 2002).

**Problem Drinking, Loneliness, and Support**

Social support, and social networks in general, have been a frequently examined area of interest for drug and alcohol treatment researchers, though it appears the relationship between support and substance use outcomes is still unclear. Older adult problem drinkers have been shown to have higher levels of support and larger friend groups, as well as fewer friends who also had alcohol problems (Lemke & Moos, 2002) and older adults who received more support
via self-help groups and sponsors had better drinking outcomes at 1 and 5 years (Lemke & Moos, 2003). Additionally, a higher than median level of spousal support has been shown to increase the odds of seeking treatment for an alcohol use disorder, but higher social support from relatives reduced the odds of seeking treatment for mental health services (Maulik, Eaton, & Bradshaw, 2009). Qualitative studies examining treatment preferences of older adult problem drinkers have shown that caring and concerned workers and the option of opening up treatments to friends and family is a highly desired feature (Holland, et al., 2016). However, little research has been done examining the specific outcome effects of these variables on older adult treatment success.

Alcohol has long been thought to be linked with loneliness, though the exact relationship has remained unclear. Loneliness has been described as an antecedent to drinking by older adults and is cited as a common emotion that is felt prior to consuming alcohol (Schonfeld & Dupree, 1991). However, for many correlates of loneliness such as alcohol use and depression, it is difficult to distinguish between the behaviors that are a result of loneliness, behaviors that cause loneliness, and behaviors that simply accompany loneliness. Alcohol may have a similar relationship to loneliness that depression and functionality have been found to have, where it is both affected by and affects loneliness. This circular causation can lead to confusing and unclear links between alcohol consumption and loneliness.

Among community dwelling older adults, higher frequency of alcohol consumption was found to be associated with lower feelings of loneliness (Canham, et al., 2015) and lonely older adults were less likely to consume alcohol frequently (Canham, et al., 2016). This relationship may be interpreted in different ways. One possibility is that older adults who consume alcohol do so in social situations, thereby creating a correlation between alcohol and lower feelings of
loneliness. In order to test this, studies would need to be conducted that included setting of alcohol consumption to examine whether older adults who drink alone experience the same effect of alcohol on loneliness as older adults who drink socially. It is also possible that moderate amounts of alcohol have a reduction effect on feelings of loneliness in some people, similar to alcohol’s effects on people’s inhibitions (Montemurro & McClure, 2005). Regardless, the potential negative health impacts of alcohol on older adult health make it difficult to be considered as a tool against loneliness.

Canham and colleagues (2016) also found that there was no significant relationship between loneliness and binge drinking. However as mentioned prior, it is possible that older adults drink at levels that numerically do not qualify as binge drinking but could still be having both mental and physical health problems over time. Further, Canham and colleague’s studies on alcohol and loneliness did not include measures of support and their analysis was cross-sectional. Although some types of social support have been shown to increase the likelihood of treatment seeking behavior, little is known regarding the impact of problem alcohol use on an older adult’s feelings of social support prior to entering treatment. Therefore, this study aims to observe the effect alcohol has on an older adult’s feelings of loneliness and support over time when older adults drink at problem levels.

Methods

Sample

Data for this study come from the National Social Life, Health, and Aging Project (NSHAP), a survey of community-dwelling older adults born between 1920 and 1947 (57 to 85 years old at the time of the first wave) (Waite, Laumann, Levinson, Lindau, & O’Muircheartaigh, 2018). The purpose of the NSHAP was to obtain a variety of data from older adults on physical
and mental health, as well as social networks and sexual relationships. The NSHAP used a nationally representative sampling technique which oversampled African-Americans and Hispanics. The sample is based on the sampling frame from the Health and Retirement Study (HRS). Ninety-two percent of people selected were eligible for the study, resulting in a Wave 1 sample size of n=3,005. For the second wave, the NSHAP also included interviews with intimate partners of Wave 1 respondents, resulting in a final sample size of n=3,377. However, of these only n=2,261 were original respondents from Wave 1. Only respondents who were current alcohol drinkers were asked questions regarding problem drinking. This, along with listwise deletion used to handle missing variables, resulted in an operating sample size of n=1,296.

**Measures**

*Problem Drinking*

Problem drinking for this study was a binary measure created from scores using the CAGE questionnaire (Ewing, 1984). The CAGE (an acronym for its four questions: Cut down, Annoyed by criticism, Guilty feeling, and Eye-opener) is the most widely used and tested alcohol screening instrument, due in part to its ease of remembrance and short duration (O’Connel, et al., 2004). The CAGE questionnaire is useful for screening older adults as it can easily be included in routine health appointments with primary care physicians (PCPs), which is the most likely setting for problem drinking to be identified for older adults. A positive response to one of the four yes/no questions is given a score of 1, and generally a score of 2 or above is used as a cutoff, though some research has suggested the use of a cutoff score of 1 for older adults (O’Connell, et al., 2004). With a cutoff of ≥1, the CAGE has a sensitivity ranging from 38.9% - 98%, with an average sensitivity of 88% across 7 studies, and a specificity ranging from 48% - 100%, with an average of 85% (O’Connell, et al., 2004).
Loneliness and Social Support

Measures for loneliness and social support for this study were operationalized using the perceived isolation scale originally created and validated by Cornwell & Waite (2009). The perceived isolation scale is composed of the shortened version of the UCLA Loneliness Scale (R-UCLA) (Russell, Peplau, & Cutrona, 1980) as well as six questions regarding the respondent’s ability to open up and rely on family, friends, and spouse. The R-UCLA Loneliness scale was originally a 20-item instrument; however, it was shortened to just 3-items: “I feel left out”, “I feel isolated”, and “I feel I lack companionship” (Hughes, Waite, Hawkley, & Cacioppo, 2004). All answers ranged from 1 to 3, including “Hardly ever/Never”, “Sometimes”, and “Often”. The shortened version of R-UCLA was found to have an alpha coefficient of reliability of .72, which is lower than the reliability of the longer version, however the shortened scale has good internal consistency and is believed to be a reliable measure of loneliness (Hughes, et al., 2004). Social support questions also ranged from 1 to 3, with 1= “Often”, 2= “Some of the time” and 3= “Hardly ever/Never”. The combined perceived social isolation scale was found to have an overall alpha coefficient of reliability of .70. For the purpose of this study, the separate measures of loneliness and support were used to create latent variables for each phenomena.

Functional Ability

Functional ability in the model was operationalized as two separate types of functioning, using the Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) scales created by Huisingh-Scheetz and colleagues (2014). The ADL included questions regarding the difficulty in completing the following seven activities: a) walking a block, b) walking across the room, c) dressing, d) bathing or showering, e) eating, f) getting in and out of bed, and g) using the toilet, including getting up and down. The IADL included questions
regarding a person’s difficulty in: a) driving during the day, b) driving at night, c) preparing meals, d) managing money, e) taking medications, f) shopping for groceries, g) doing light house work, and h) using the telephone. Answer options for all questions included “No difficulty”, “Some difficulty”, “Much difficulty”, and “Unable to do”. Answers were then recoded, with “No difficulty” responses receiving a score of 1, and the rest receiving a score of 0. Therefore, the ADL scores ranged from 0 to 7 and the IADL ranged from 0 to 8, with 7 and 8 representing the highest functional ability, respectively.

**Depression**

Depression was operationalized using participant’s answers to a shortened 11-item version of the Center for Epidemiology Studies Depression (CESD) scale (Kohout, Berkman, Evans, & Cornoni-Huntley, 1993), which has been shown to have good internal and criterion validity with the full 20-item version. Responses to the questionnaire consisted of a four-point categorical scale, from 0 (Never) to 3 (All the time). Answers were then summed, and a cutoff score of 9 was used to create a dichotomized measure of depression.

**Demographic Variables**

Demographic variables for this study included age, originally a continuous variable that was recoded categorically (57-64, 65-74, 75+) in order to potentiate SEM group analysis; gender, a dichotomous variable; race, a categorical variable (White, Black, Hispanic, and Other), which was recoded as a dichotomous variable (White, Non-White) for group analysis due to group sizes; and marital status, originally a categorical variable (Married/Living together, Divorced/Separated, Widowed, Never Married), which was recoded as a dichotomous variable (Widowed/Not Widowed) due to group sizes.
Analysis

Analysis was conducted using both STATA 12 and the lavaan package for R statistical software (StataCorp, 2011; R Development Core Team, 2008; Rosseel, 2012). Bivariate relationships and levels of missingness were examined first. Next, perceived isolation was tested using a confirmatory factor analysis. Although the overall perceived isolation scale has good reliability, it loaded poorly as a single factor. A two-factor model was then attempted, with separate factors representing both loneliness and social support. A decision was made to keep loneliness and support as two separate factors in the full structural model in order to examine the specific effects problem drinking and depression have on each individual factor. An SEM model was then created using data from both waves. Wave 2 loneliness and social support factors were used as endogenous latent variables, with functional capacity, depression, and problem drinking used as exogenous variables, as well as Wave 1 loneliness and support. See figure 3.1 for full model details. Separate group models were also conducted to examine the differences between demographic variables.
Figure 3.1: Full SEM Model
Results

Among the first wave sample of NSHAP participants, 17.67% were identified as problem drinkers when using a CAGE cutoff score of $\geq 1$. Wave 2 of the NSHAP did not include the CAGE questionnaire. Along with this, 15.82% of participants met the CESD-10 cutoff for major depressive disorder. The sample was predominantly Non-Hispanic white (70.5%) and married (61.93%), with around equal numbers of men and women (51.61% female). The mean age of NSHAP participants at Wave 1 was 69 (SD: 7.85), with ages ranging from 57 to 85. The mean Activities of Daily Living score (0-7) was 6.19, and the mean I Activities of Daily Living score (0-8) was 6.94.

Table 3.1: Bivariate Results

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<th>Non-Problem Drinkers N=2,474 (82.31%)</th>
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<td>Widowed</td>
<td>22</td>
<td>12.81</td>
<td>23.97</td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>3.69</td>
<td>4.14</td>
<td>3.6</td>
<td></td>
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</tbody>
</table>
On the bivariate level, problem drinking was significantly associated with age ($X^2 [2, N=3,005] = 27.03, p<.01$), gender ($X^2 [1, N=3,005] = 159.76, p<.01$), and marital status ($X^2 [3, N=3,005] = 31.76, p<.01$). See Table 3.1 for more details. Additionally, respondents who were identified as problem drinkers were more likely to feel left out ($X^2 [2, N=1,664] = 23.91, p< .01$), feel isolated ($X^2 [2, N=1,816] = 16.58, p< .01$), and feel they lack companionship ($X^2 [2, N=1,530] = 20.86, p< .01$) at Wave 1. Problem drinking was not significantly associated with MDD, race/ethnicity, or ADL/IADL.

Structural Equation Modeling (SEM) using the lavaan package for R statistical software was used to examine the effect problem drinking had on older adults’ feelings of loneliness and support over time. The measurement model for this study was composed of latent measures for loneliness and support and were first validated using confirmatory factor analysis (CFA).

**Figure 3.2: Wave 1 CFA**
Overall the model for loneliness and support fit well for both waves (Wave 1: CFI= 0.967, TLI= 0.937, RMSEA= 0.071 , SRMR= 0.031 ; Wave 2: CFI= 0.971, TLI= 0.945, RMSEA= 0.067 , SRMR= 0.028). Factor loadings were relatively uniform for the loneliness measure, however the support measure had a clear delineation of loadings between support measures associated with friends and measures associated with family. See Figures 3.2 and 3.3 for more details. Bivariate analysis of problem drinking’s effect on latent measures of loneliness and support showed significant relationships, with problem drinkers having higher feelings of loneliness ($\beta$: 0.231, Std.Error: 0.066, Std.All: 0.075, $p < .01$) and lower feelings of support ($\beta$: -0.426, Std.Error: 0.089, Std.All: -0.138, $p < .01$) at Wave 2. See Figure 3.4 for more details.

Figure 3.3: Wave 2 CFA
Figure 3.4: Bivariate Latent Results

The structural model was composed of problem drinking, depression and activities of daily living, along with Wave 1 loneliness and support, regressed on Wave 2 loneliness and support. The overall model fit well (CFI=0.930, TLI=0.900, RMSEA=0.057, SRMR=0.070), although the Chi-square test was still significant ($X^2 [108, N=1,296] = 566.11, p<.001$), meaning the null hypothesis could not be rejected. However, Chi-square test for SEM is notorious for being affected by larger sample sizes and is almost always significant with models that include over 400 cases (Kenny, 2008). Within the structural model, problem drinking at Wave 1 was a significant predictor of increased feelings of loneliness ($\beta: 0.238$, Std.All: 0.079) and decreased feelings of support ($\beta: -0.595$, Std.All: -0.154) at Wave 2. Wave 1 depression was a significant predictor of increased feelings of loneliness at Wave 2 ($\beta: 0.356$, Std.All: 0.105), but not a significant predictor for feelings of support. See Figures 3.5 and 3.6 for full model details and results. Additionally, Instrumental Activities of Daily Living score was significantly associated with lower feelings of loneliness at Wave 2 ($\beta: -0.102$, Std.All: -0.130).

Group models run to examine gender differences showed that problem drinking was significantly associated with increased feelings of loneliness for women but not for men.
(women: $\beta$: 0.300, Std.All: 0.075). Likewise, problem drinking was significantly associated with lower feelings of social support for men, but not for women (men: $\beta$: -2.104, Std.All: -0.107).

Figure 3.5: Full Model Results

Group models examining differences in marital status showed that problem drinking was a significant predictor for lower feelings of support for widowers ($\beta$: -0.248, Std.All: -0.226), as well as a significant predictor of both loneliness and support for individuals who were currently married or living with a partner (loneliness- $\beta$: 0.229, Std.All: 0.078; support- $\beta$: -0.415, Std.All: -0.134). Additionally, group models examining race/ethnicity found that problem drinking was a significant predictor of both loneliness and support for both groups (White/Non-White), however problem drinking had a larger impact on feelings of loneliness for Non-White participants than White (Non-White: $\beta$: 0.420, Std.All: 0.144; White: $\beta$: 0.186, Std.All: 0.060).
**Discussion**

America will soon have an older adult population that is larger in size than ever before, with individuals living longer than ever before. This increase in population and life expectancy makes understanding the complex relationships between long-term alcohol consumption at all levels and mental and physical health imperative in providing older adults with the best opportunities at successful aging. This study sought to provide further evidence regarding the effect of problem drinking on social outcomes of older adults over time. Results suggest that older adults who are problem drinkers are more likely to experience increased feelings of loneliness as well as lower feelings of support from friends and family.
These results suggest problem drinking may contribute to a number of negative health outcomes for older adults beyond the already understood direct effects. Because problem drinking is likely to lead to lower feelings of support and higher feelings of loneliness, the three conditions may compound on each other increasing the overall negative outcomes usually experienced when they occur separately. For instance, although moderate alcohol consumption has been shown to have some protective effects on cardiovascular health, loneliness has frequently been shown to have negative cardiovascular effects. In this way, older adults who drink at problem levels, which although physically may not have negative heart effects, may still incur these negative impacts through increased feelings of loneliness.

Problem drinking’s effect on social support may also impact feelings of stress in an older adult’s life. Social support has been shown to act as a buffer to stress, however if problem drinking lowers a person’s feelings of support it may also result in increased feelings of stress. This can be particularly bad because higher feelings of stress are often linked as antecedents to alcohol consumption. This potential relationship brings attention to the dangerous recursive effects that are likely to take place in the relationship between alcohol, loneliness, and support. There is a potential destructive pathway whereby problem drinking leads to lower feelings of support and higher feelings of loneliness, which then lead back again to increased drinking. Future longitudinal studies will be needed to better understand the ways in which the negative effects of alcohol, loneliness, and support compound on one another.

These results also provide important information for screening and intervention programs for older adult problem drinkers. Older adults are the least likely population group to perceive a need for or seek treatment (Choi, DiNitto, & Marti, 2014) and the least likely to be screened for drug and alcohol use (Duru et al., 2010). These statistics, along with the projections regarding
the increased need for substance use treatment among the older adult population, suggest a need for changes in the way health and social service providers address older adult substance use. One of the potential reasons for the decrease in screening and treatment seeking from this population may be the stigma related to alcohol use (Keyes et al., 2010). Because of this, it is possible that questions regarding loneliness or feelings of support could be used as an opening to alcohol screening.

Brief interventions for problem drinking have been shown to be effective in reducing alcohol consumption among older adults. Results from this study suggest that such interventions could help in reducing not only alcohol consumption, but possibly aid in decreasing loneliness and increasing feelings of support as well. The complex and recursive relationship between alcohol, loneliness, and support emphasizes the need for all three problems to be addressed when interventions are attempted. This means when older adults screen positive for problem drinking, feelings of loneliness and support should be assessed as well. Loneliness and support issues could also be integrated into more intensive forms of treatment by ensuring that age-specific treatment programs that are designed for older adult substance users include same-age peer support groups, as well as resources to address loneliness and support outside of treatment. With access to the internet and forms of online communication increasing, digital social support could present new opportunities for older adults, especially older adults with mobility issues who are unable to reliably attend physical support groups.

Limitations

Although this study provides new insight into the relationship between problem drinking and social outcomes, there are important limitations to consider when interpreting these results. Firstly, the sample of the NSHAP at its first wave only had ages ranging from 57 to 85, limiting
the availability of examining the full spectrum of older adult loneliness as it has been shown to continually increase as a person ages beyond 80 (Dykstra, 2009). There are also issues surrounding the operationalization of problem drinking, since the CAGE questionnaire is not able to distinguish between current and lifetime alcohol problems. Lastly, although the support measure has been used in previous studies (see Cornwell & Waite, 2009), it likely does not capture all types of support as defined by Cobb (1976). Future studies could attempt to verify these results using alternative measurements for problem drinking and social support.

**Conclusion**

With a growing population that has been shown to continue drinking at higher levels than past cohorts of older adults, it is becoming imperative that healthcare and social service workers understand the complex effects of alcohol on older adult’s feelings of loneliness and support, as all three phenomena have a significant effect on physical, psychological and social health. These changes require an increased attention to screening and interventions for both alcohol, loneliness, and support for older adults. Research examining the effectiveness of a holistic intervention which addresses both alcohol, loneliness, and support problems is needed to determine the level of benefit of such a program. Additional research is also needed to understand if feelings of loneliness reduce alongside alcohol use as a result of interventions. Results from this study also highlight potential differences in the way problem drinking affects loneliness and support depending on an individual's gender, marital status and race. Future studies may attempt to corroborate these results in order to provide practitioners with important information regarding additional alcohol related risk-factors for loneliness and support.
Chapter 4:

Older Adult Brief Alcohol Interventions: A Scoping Review and Meta-Analysis

Introduction

The need for alcohol and drug treatment among the older adult population is rising at a rate faster than other age cohorts in America (Arndt, Clayton, & Schultz, 2011). However, older adults are the least likely group to perceive a need for treatment or to be screened for a substance use problem (Choi, DiNitto, & Marti, 2014; Duru, et al., 2010). Individuals working in social services are in an apt position for screening and providing brief interventions for people with substance use problems, and may be able to alleviate the increased burden faced by primary care physicians (PCPs) who traditionally have provided the majority of this role for older adults. Although brief interventions have been shown to be an effective means of treatment for low to mid-risk drinkers, relatively little research has been done examining the effectiveness of brief interventions in older adult populations. Additionally, little is known regarding the effectiveness of brief interventions when conducted outside of a clinical setting or when performed by people other than physicians. Therefore, the purpose of this study is to provide a scoping review of the evidence for brief intervention studies among older adult populations with particular attention to provider and setting, and to examine the overall effectiveness of brief interventions via a meta-analysis of available studies.

Brief Interventions

Although the common conception of an alcohol problem is that of a severe Alcohol Use Disorder (AUD), or what previously was known as alcohol dependence, a larger portion of
individuals experiencing significant biological, psychological, social, and legal consequences are those drinking at mild and moderate AUD levels. For people who have progressed to a severe level of AUD, necessary treatment typically involves lengthy and strict regimens, in part because alcohol withdrawal itself has potentially serious health consequences. However, for the larger portion of problem alcohol users for whom lengthy and inpatient treatment programs are not necessary, alternative treatment methods for reducing risky and harmful drinking are available. This idea of easily conducted and relatively short forms of treatment or intervention have been come to be known as brief interventions, also sometimes described as brief advice or by the specific technique of motivational interviewing.

The concept of brief interventions has been in existence for many years. As Babor (1994) discovered, examples of short self-help pamphlets detailing instructions on recovering from problem alcohol use have existed since at least the early 18th century. Brief interventions are an important aspect on the continuum of treatment and services for alcohol problems because they offer an inexpensive and low-intensity model that has been shown to be effective in reducing harmful and hazardous drinking. The practice of initiating an intervention as soon as a potential alcohol problem is discovered is important because studies have shown that referral to outside treatment sources alone is often not successful in reducing problem drinking (Chafetz, et al., 1962; Luckie, White, Miller, Icenogle, & Lasoski, 1995). Chefetz and colleagues were some of the first researchers to recognize the improvement in treatment outcomes involved in an immediate discussion of alcohol issues with patients, finding a follow up rate of 78% for patients who had received a brief intervention, compared to only 7% for those who received a referral alone (Chafetz, et al., 1962). Additionally, the sooner a potential alcohol problem is detected and addressed is associated with more favorable outcomes.
Traditionally the PCP has been the medium through which brief interventions are most frequently conducted. This is especially true for older adult problem drinkers, as they are less likely to enter treatment through alternative means such as self-admission and contact with the legal system (Sahker, Schultz, & Arndt, 2015). However, this propensity presents many issues for ensuring the most comprehensive detection of problem drinking in the older adult population due to an overburdened healthcare system, as well as increased stigma on both the part of the patient and the physician (Blow, 1998; Johnson & Seale, 2015; Keyes et al., 2010). Because of this, for a long time it has been recommended that both nurses and social workers be able to provide brief interventions (Skinner & Holt, 1983), however inadequate research has been done comparing the effectiveness of brief interventions by provider and setting.

Typically, a brief intervention is composed of an initial 10 to 15-minute session, though some definitions of brief interventions allow the initial session to last as long as 60 minutes, focusing on personalized feedback about a person’s alcohol use, often based on answers patients provided to an alcohol screening measures. The feedback generally includes educational information regarding drinking guidelines as well as the health effects and risks caused by drinking alcohol at the level at which the individual drinks. Brief interventions may include physical materials such as workbooks and pamphlets that people may take with them, along with the use of a drinking diary to track their alcohol consumptions. Interventions usually end with the patient and provider making an agreement or goal to reduce drinking. Often these sessions will be followed up with “booster” sessions, typically conducted at either 1 or 3-month intervals. These booster sessions include reviewing the individuals progress regarding the changes in drinking behaviors and providing additional encouragement for the individual to continue meeting their drinking goals.
The overall goal of a brief intervention is to either decrease a person’s level of drinking, and thereby the problems associated with their drinking, or if they are not ready to take a step towards reduction, then the goal is to increase their motivation to reduce their drinking. Additionally, for individuals with more severe alcohol problems, screening and brief interventions provide an avenue to treatment through referrals and to increase their motivation to follow through with the referral. When screening and brief interventions are conducted, outcomes are found to be overall positive in a variety of populations. A meta-analysis of brief interventions conducted among heavy drinkers found that groups who had received a brief intervention were nearly twice as likely to moderate their drinking at 6 and 12-month follow-ups when compared to control groups (Wilk, Jensen, & Havighurst, 1997). Another meta-analysis examining individuals in primary care settings found that even when brief interventions are conducted impromptu, meaning the patient did not enter the clinic with alcohol use being a presenting problem, they are still effective at reducing drinking levels at 6 and 12 months (Bertholet, Daeppen, & Wietlisbach, 2005).

Other meta-analyses call into question the long-term effectiveness of brief interventions initiated from screening in general practice (Beich, Thorsen, Rollnick, 2003). A large majority of brief intervention studies have a terminal follow-up time frame of 12 months, leaving little evidence towards the long-term validity of brief interventions. Among the most prominent meta-analyses of brief interventions, only one study focusing on older adults was typically included (Flemming, et al., 1999) and no meta-analysis examining the overall effectiveness of brief interventions for older adult populations was found.

For this study, a brief intervention will be defined as any discussion-based intervention of short duration (no more than 60 minutes) with the goal of reducing an individual's alcohol
consumption or consequences from drinking. Interventions should conclude after no more than 4
sessions, not counting any “booster” sessions done at a later date, although this has notoriously
been a difficult criterion to distinguish due to unclear reporting from studies (Babor, 1994;
Moyer, Finney, Swearingen, & Vergun, 2002). Further criteria to interventions that Babor
suggests, of which this study will not discriminate for inclusion purposes, include: the timing of
the intervention (early vs late in the individual’s drinking career), the setting of the intervention
(physician’s office, work, other social services setting), and the person responsible for initiating
the intervention (patient vs doctor) (Babor, 1994). These criteria will be reviewed during the
initial search phase to ensure their suitability, and the criteria of setting and provider will receive
specific analysis.

Methods

Search Strategy

Multiple databases were searched to identify relevant journal articles, including PsycInfo,
PubMed, Social Work Abstracts, SocIndex, Ageline, Cochrane Library, Social Gerontology,
Social Services Abstracts, and Google Scholar, as well as following studies cited in other
articles. Search terms used in these queries included “brief intervention”, “brief alcohol
intervention”, “brief advice”, “physician advice”, “motivational interviewing”, and “motivational
enhancement”, as well as including either “older adult” or “elderly” and “alcohol” to every
search.
Figure 4.1: Search Strategy 1
Inclusion and Exclusion Criteria

To be included in the review, studies had to meet the following criteria. First, studies had to include separate results for an age group defined as “older adult”. The age for this was allowed to vary, as some studies defined older adulthood as young as 50 and above, while others used an age cut off of 65. Second, studies had to utilize some form of quantitative methodology. Random Control Trials were preferred, however other forms of experimental designs were included to expand the depth of the study. Third, studies had to be published in a peer-reviewed journal. Fourth, studies had to include an alcohol measure as an outcome variable. This could include examining number of drinks per week, number of binge drinking sessions, reduction in level of drinking risks, etc. Finally, studies had to meet the preformed definition of a brief intervention.

Figure 4.1: Data Selection and Extraction

Data was chosen for extraction for this study based on the necessary information needed to describe and compare the quality of brief interventions that have been aimed at older adult populations. To do this, detailed information was taken from each study regarding the components and timeline of the interventions and comparison groups, the exclusion and inclusion criteria for the sample, the studies operationalization of older adulthood, drinking guidelines, the types of screening instruments used, the setting of the intervention, and the provider of the intervention. Additionally, for the meta-analysis outcome data including group sizes, drinks per week at each follow up, and standard deviations were collected.

Critical Appraisal

In order to provide some form of appraisal of the quality of the studies included in the review, a rating system put forth by the U.S. Preventive Services Task Force (USPSTF) for assessing internal and external validity was utilized, which resulted in the ranking of studies as
either “good”, “fair”, or “poor” (Harris, et al., 2001). Dimensions on which internal and external validity were appraised included: (1) inclusion of a comparison group (RCT), (2) the use of a blinding technique, (3) examining relevant and viable outcome measures, (4) sufficient level of sample retention [less than 50% attrition], (5) a clear description of the intervention, (6) adequate group sizes [above 50], (7) rigorous randomization method, and (8) sample demographics that reflected characteristics of older adult drinkers in the U.S. For this review, a good study was one that met all preformed criteria, a fair study did not meet all criteria but contained no flaw that would cause the results to be questioned, and a poor study contained a flaw that brings serious concern to the overall validity of the study’s findings.

**Meta-Analysis Inclusion**

Inclusion in the meta-analysis portion of the study required adequate statistical reporting of outcome variables. In order to calculate effect sizes for the interventions, alcohol outcome data was needed for both the intervention and comparison groups, including standard deviations. To ensure homogeneity, only studies that examined similar measures of alcohol outcomes (e.g., drinks per week, binge drinking sessions in past month) were analyzed together. Additionally, studies were grouped together depending on the type of comparison group that was used. This resulted in a meta-analysis of studies that compared brief interventions to treatment as usual (TAU) and a meta-analysis of studies that compared brief interventions to other types of treatments (enhanced referral, established alcohol treatment programs, etc.). Review Manager 5 by The Cochrane Collaboration was used to conduct the meta-analysis (RevMan, 2014). Weighting for the meta-analysis was done automatically in RevManager 5 based on the studies’ sample sizes and standard deviations.
Results

Thirteen ($N=13$) brief intervention studies met the full requirements to be included in the final review. Overall the outcomes for the studies indicated positive results for brief interventions conducted among older adults, with only 1 of the studies that used a true control group for comparison having a non-significant outcome, and its results are questionable due to group sizes under 20. Of the $N=13$ studies reviewed, 5 were rated good, 3 were rated as fair, and 5 were rated as poor. Of the 5 poor studies, 2 were rated as such due to poor retention rates and a non-RCT design and 3 were rated poor due to questionable group sizes. None of the studies included a follow-up beyond 12 months: 3 of the studies had a terminal follow-up time frame of less than 6 months, 5 had a terminal follow-up time frame between 6 and 11 months, and the remaining 6 studies had a terminal follow-up time frame of exactly 12 months. See Tables 4.1, 4.2, and 4.3 for full details regarding the studies included in this review.

Outcomes

Among the 13 studies, the most common alcohol outcomes that were measured were: (1) frequency of drinking, (2) quantity of drinking, (3) binge drinking days, (4) changes in drinking risk levels, and (5) healthcare utilization. Other outcomes that were also assessed by individual studies included alcohol related accidents/injuries and alcohol use with medications.

Frequency and Quantity of Drinking

The most commonly shared alcohol outcome variable across studies was some measure of frequency and quantity of alcohol consumption. A total of $N=11$ studies in the review included a measure of drinking frequency or quantity. These outcome measures included drinks per week, drinks per month, mean drinks in a session, number of drinking days, and number of days abstained. See Table 4.1 for which study included which measures.
Table 4.1: Intervention Characteristics

<table>
<thead>
<tr>
<th>Author &amp; Date</th>
<th>Intervention</th>
<th>Control</th>
<th>RC T</th>
<th>Setting</th>
<th>Provider</th>
<th>Length/Number of Sessions</th>
<th>Outcome Measure</th>
<th>Overall Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cucciare, et al., 2013</td>
<td>Personalized feedback based on patient's alcohol consumption level, consequences of use, risks, use of illegal drugs, and motivation to change use behavior. Feedback included education, gender normative use rates, and summary of financial/social/health consequences.</td>
<td>TAU</td>
<td>Yes</td>
<td>Online</td>
<td>Web-delivered program</td>
<td>10-15-minute online session. Follow up calls at 3 and 6 months from researchers.</td>
<td>Percentage of heavy drinking days, mean drinks in a session, total number of drinking days, severity of alcohol-related problems.</td>
<td>+</td>
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<tr>
<td>Ettner, et al., 2014</td>
<td>Personalized drinking report, an education booklet, a drinking diary, and a tip sheet. Physician reviewed alcohol information at appointments and advised participant to reduce drinking. Additionally, a health educator contacted 3 times via phone with feedback and discussions on goal setting and behavior modification.</td>
<td>TAU</td>
<td>Yes</td>
<td>Clinic/ PCP Office</td>
<td>Physicians and health educators</td>
<td>Regular doctor appointments and 3 health educator phone calls.</td>
<td>Changes in drinking risk level as well as drinks per week, heavy episodic drinking, and alcohol discussions. Also examined healthcare utilization and cost of brief intervention.</td>
<td>+</td>
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<tr>
<td>Fink, et al., 2005</td>
<td>First intervention group: Both patient and physician receive report regarding participants alcohol use and risks, along with personalized alcohol education material. Second intervention group: Only patient receives report regarding their alcohol use and risks, along with personalized alcohol education material.</td>
<td>TAU</td>
<td>Yes</td>
<td>Clinic/ PCP Office</td>
<td>Physicians/Mailed Report</td>
<td>Regular doctor appointments</td>
<td>Reduction in hazardous or harmful drinking, measured by the CARPS along with drinks per week</td>
<td>+</td>
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<tr>
<td>Fleming, et al., 1999</td>
<td>Received a general health booklet; a workbook containing feedback on their health behaviors; a review with physician regarding prevalence, reasons for drinking, adverse effects of alcohol, drinking cues; a drinking agreement in the form of a prescription from doctor; and drinking diary cards</td>
<td>Pamphlet</td>
<td>Yes</td>
<td>Clinic/ PCP Office</td>
<td>Physicians</td>
<td>Two 10-15-minute visits with physician Received follow up calls from nurse 2 weeks after each appointment.</td>
<td>Mean drinks per week, binge drinking occasions in the past 28 days, and times had more than 20/13 drinks per week (Men/Women). Additionally, examined other health outcomes such as smoking, accidents/injuries, and hospital visits</td>
<td>+</td>
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<tr>
<td>Author &amp; Date</td>
<td>Intervention</td>
<td>Control</td>
<td>Setting</td>
<td>Provider</td>
<td>Length/Number of Sessions</td>
<td>Outcome Measure</td>
<td>Overall Effect</td>
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<td>Gordon, et al., 2003</td>
<td>First intervention: Brief advice and feedback regarding their level of drinking, advice to stop or reduce alcohol consumption. Second Intervention: Motivational enhancement with two boosters. Bidirectional interaction encouraging patients to elaborate and discuss their feelings towards alcohol use and consequences.</td>
<td>TAU</td>
<td>Clinic/ PCP Office</td>
<td>Trained research interventionists</td>
<td>FI: One 10-15 minutes sessions. SI: Initial 45-60-minute session, with two 10-15-minute booster sessions</td>
<td>Drinks per month, drinks per day when drinking, number of days abstained.</td>
<td>-</td>
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<td>Gottlieb Hansen, et al., 2011</td>
<td>Motivational interviewing techniques with the goal to elicit change in alcohol behavior, as well as information regarding local alcohol treatment centers</td>
<td>Pamphlet</td>
<td>Health Examination Premise</td>
<td>Nurses, psychologist, and sociologist</td>
<td>10-minute intervention followed by a 5-minute booster phone call 4 weeks later</td>
<td>Drinks per week</td>
<td>-</td>
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<tr>
<td>Kuerbis, et al., 2015</td>
<td>A letter informing participants the study was testing whether giving information on healthy behaviors would help reduce risks associated with alcohol use, a personalized feedback report, two alcohol education booklets, and a reminder that there will be a follow-up in 3 months. Utilized a harm reduction model designed for older adults consisting of motivational interviewing strategy. First session determined motivators for changing drinking habits and established goals. Following sessions reviewed progress.</td>
<td>Informed of study</td>
<td>Mail</td>
<td>Mailed report</td>
<td>Single mailed report</td>
<td>At-risk drinking, quantity and frequency of drinking, binge drinking, alcohol use with prior condition, alcohol use with medications</td>
<td>+</td>
<td></td>
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<tr>
<td>Lee, et al., 2009</td>
<td>Personalized discussion with PCP with prescription to reduce drinking. Follow up conversations via telephone with health educators using motivational interviewing techniques.</td>
<td>ER</td>
<td>Clinic/ PCP Office</td>
<td>Social workers</td>
<td>Three sessions</td>
<td>Number of drinks per week and number of binge drinking sessions. Also assessed access to treatment.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Moore, et al., 2011</td>
<td></td>
<td>ER</td>
<td>Clinic/ PCP Office &amp; Telephone</td>
<td>Physicians and health educators</td>
<td>Initial discussion with PCP followed by 3 phone calls from health educators at 2, 4, and 8 weeks</td>
<td>At-risk drinking, drinks per week, and number of heavy drinking days</td>
<td>+</td>
<td></td>
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<tr>
<td>Author &amp; Date</td>
<td>Intervention</td>
<td>Control</td>
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<td>Oslin, et al., 2003</td>
<td>Regularly scheduled phone conversations focused on developing a plan, offering support and education, and monitoring effects. Interventionists completed workbooks via phone and mailed to participants.</td>
<td>TAU</td>
<td>Yes</td>
<td>Telephone</td>
<td>Behavioral health specialists</td>
<td>7 phone calls</td>
<td>Drinks per week, binge drinking episodes in 3-month period, and at-risk drinking</td>
<td>+</td>
</tr>
<tr>
<td>Oslin, et al., 2006</td>
<td>Received workbook focusing on drinking cues, reasons to cut down. Also received prescription to reduce drinking.</td>
<td>ER</td>
<td>Yes</td>
<td>Clinic/PCP Office</td>
<td>Physicians</td>
<td>Three 20-30-minute sessions</td>
<td>Drinks per week and binge drinking episodes in past 3 months</td>
<td>-</td>
</tr>
<tr>
<td>Schonfeld, et al., 2010</td>
<td>Health Promotion Workbook, Goal setting, alcohol education (medication interactions, health issues, consequences of drinking for older adults), used motivational interviewing techniques</td>
<td>N/A</td>
<td>No</td>
<td>Majority in Home</td>
<td>Addiction specialists, nurses, social workers, and mental health counselors</td>
<td>1 to 5 sessions</td>
<td>SMAST-G Score</td>
<td>+</td>
</tr>
<tr>
<td>Schonfeld, et al., 2015</td>
<td>Not specifically described, but likely the same as Schonfeld, et al., 2010 as it is a larger implementation of the pilot study described in the earlier article.</td>
<td>N/A</td>
<td>No</td>
<td>Majority in Home</td>
<td>Addiction specialists, nurses, social workers, and mental health counselors</td>
<td>Intervention based on ASSIST risk score: low risk received screening and feedback; moderate risk received brief intervention sessions; and high risk received brief treatment.</td>
<td>Number of days used alcohol, number of days greater than or equal to 5 drinks, and number of days 4 or fewer drinks but still felt high</td>
<td>+</td>
</tr>
<tr>
<td>Author &amp; Date</td>
<td>Total Sample Size</td>
<td>Group Sizes</td>
<td>Randomization Method</td>
<td>Blinding</td>
<td>Final Response Rate (%)</td>
<td>Follow Up Duration</td>
<td>Quality</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------</td>
<td>-------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>----------</td>
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<td>--------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Cucciare, et al., 2014</td>
<td>n=167</td>
<td>i:89/c:78</td>
<td>Randomized using number generator prior to baseline assessment</td>
<td>Yes</td>
<td>i:84.2/c:85.9</td>
<td>3 and 6 months</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Ettner, et al., 2014</td>
<td>n=1186</td>
<td>i:546/c:640</td>
<td>Physician level randomization using [0,1] distribution drawing (14 control and 17 intervention)</td>
<td>Yes</td>
<td>i:80.4/c:95.3</td>
<td>3, 6, and 12 months</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Fink, et al., 2005</td>
<td>n=665</td>
<td>i1:198/i2:245/c:222</td>
<td>Physician level randomization</td>
<td>No</td>
<td>96</td>
<td>12 months</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Fleming, et al., 1999</td>
<td>n=158</td>
<td>i:78/c:67</td>
<td>Men and women randomized separately, each physician received intervention and control patients.</td>
<td>Yes</td>
<td>i:90.5/c:94.4</td>
<td>3, 6, and 12 months</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Gordon, et al., 2003</td>
<td>n=45</td>
<td>i1:15/i2:18/c:12</td>
<td>Participant level randomization, specific method not mentioned</td>
<td>No</td>
<td>N/A</td>
<td>1, 3, 6, 9, and 12 months</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Gottlieb Hansen, 2011</td>
<td>n=772</td>
<td>i:391/c:381</td>
<td>Participant level randomization by drawing of envelopes. Control group knew they were in control group.</td>
<td>No</td>
<td>i:80.8/c:78.7</td>
<td>6 and 12 months</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Kuerbis, et al., 2015</td>
<td>n=86</td>
<td>i:44/c:42</td>
<td>Participant level randomization using permuted blocks</td>
<td>Yes</td>
<td>i:86.4/c:97.6</td>
<td>3 months</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Lee, et al., 2009</td>
<td>n=34</td>
<td>i:13/c:7</td>
<td>Participant level randomization, specific method not mentioned</td>
<td>No</td>
<td>i:92.9/c:35.0</td>
<td>6 months</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Author &amp; Date</td>
<td>Total Sample Size</td>
<td>Group Sizes</td>
<td>Randomization Method</td>
<td>Blinding</td>
<td>Final Response Rate (%)</td>
<td>Follow Up Duration</td>
<td>Quality</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
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<td>----------</td>
<td>-------------------------</td>
<td>--------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Moore, et al., 2011</td>
<td>n=631</td>
<td>i:310/c:321</td>
<td>Men and women randomized separately using computer generated randomized numbers. Each physician received intervention and control patients.</td>
<td>Yes</td>
<td>i:71.6/c:93.1</td>
<td>3 and 12 months</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Oslin, et al., 2003</td>
<td>n=31</td>
<td>i:16/c:15</td>
<td>Physician level randomization, specific method not mentioned.</td>
<td>No</td>
<td>i:43.8/c:20.0</td>
<td>4 months</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Oslin, et al., 2006</td>
<td>n=560</td>
<td>i:280/c:280</td>
<td>Participant level randomization using permuted blocks</td>
<td>No</td>
<td>i:81.0/c:85.0</td>
<td>6 months</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Schonfeld, et al., 2010</td>
<td>n=244</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>24.6</td>
<td>1 month</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Schonfeld, et al., 2015</td>
<td>n=6,600</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>33.1</td>
<td>6 months</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Date</td>
<td>Sex</td>
<td>Age</td>
<td>Drinks Per Week</td>
<td>Binge Drinking</td>
<td>Screening Method</td>
<td>Other Inclusion</td>
<td>Exclusion</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
<td>-----</td>
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<td>-----------------</td>
<td>----------------</td>
<td>------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cucciare et al.</td>
<td>2013</td>
<td>M/F</td>
<td>Not clear</td>
<td>N/A</td>
<td>5 or more (men)/4 or more (women) drinks</td>
<td>AUDIT-C &amp; Timeline Follow Back</td>
<td>AUDIT-C score of _&gt; 4 (Men) or _&gt;3 (Women), Veteran Status</td>
<td>Terminal illness, severe cognitive impairment, or a psychotic disorder</td>
</tr>
<tr>
<td>Ettner, et al.</td>
<td>2014</td>
<td>M/F</td>
<td>60 +</td>
<td>N/A</td>
<td>N/A</td>
<td>CARET</td>
<td>An alcoholic drink in the past 3 months</td>
<td>Cognitive impairment, terminally ill, living in skilled nursing facility, moving within a year, didn't speak English, abstainers, drank more than 7 drinks a day, too frail</td>
</tr>
<tr>
<td>Fink, et al., 2005</td>
<td>2005</td>
<td>M/F</td>
<td>65 +</td>
<td>N/A</td>
<td>N/A</td>
<td>CARPS</td>
<td>An alcoholic drink in the past 3 months</td>
<td>No specific exclusion criteria mentioned</td>
</tr>
<tr>
<td>Fleming, et al., 1999</td>
<td>1999</td>
<td>M/F</td>
<td>65 +</td>
<td>Men: &gt;11 Women: &gt;8</td>
<td>4/3 (M/W) or more drinks in the same session, twice in the past 3 months</td>
<td>CAGE</td>
<td>CAGE score of 2 or higher</td>
<td>Had attended alcohol treatment program or experienced withdrawal symptoms in the past year; had received physician advice to change alcohol use in past 3 months; consumed more than 50 drinks per week; or had suicidal thoughts</td>
</tr>
<tr>
<td>Gordon, et al., 2003</td>
<td>2003</td>
<td>M/F</td>
<td>65 +</td>
<td>Men: &gt;16 Women: &gt;12</td>
<td>N/A</td>
<td>AUDIT</td>
<td>AUDIT score of 8 or higher</td>
<td>Having attended treatment for alcohol problem in the past year or current malignancy.</td>
</tr>
<tr>
<td>Gottlieb Hansen, et al., 2011</td>
<td>2011</td>
<td>M/F</td>
<td>50 +</td>
<td>Men: &gt;21 Women: &gt;14</td>
<td>5 or more drinks</td>
<td>N/A</td>
<td>None</td>
<td>No specific exclusion criteria mentioned</td>
</tr>
<tr>
<td>Kuerbis, et al., 2015</td>
<td>2015</td>
<td>M/F</td>
<td>50 +</td>
<td>&gt;_8</td>
<td>N/A</td>
<td>CARET</td>
<td>Scoring at-risk on the CARET</td>
<td>No specific exclusion criteria mentioned</td>
</tr>
<tr>
<td>Lee, et al., 2009</td>
<td>2009</td>
<td>M/F</td>
<td>65 +</td>
<td>Men: &gt;14 Women: &gt;12</td>
<td>4 or more drinks in the same session, 4 or more times, during the past 3 months</td>
<td>N/A</td>
<td>Also examined depression and anxiety</td>
<td>Cognitive impairment, psychosis, physical frailty, having received mental health or substance abuse treatment in preceding 3 months</td>
</tr>
<tr>
<td>Moore, et al., 2011</td>
<td>2011</td>
<td>M/F</td>
<td>55 +</td>
<td>N/A</td>
<td>4 or more drinks on the same occasion</td>
<td>CARET</td>
<td>Scoring at-risk on the CARET</td>
<td>Could not hear questions, too ill, or had received treatment for AUD in the past 3 months</td>
</tr>
<tr>
<td>Author</td>
<td>Date</td>
<td>Sex</td>
<td>Age</td>
<td>Drinks Per Week</td>
<td>Binge Drinking</td>
<td>Screening Method</td>
<td>Other Inclusion</td>
<td>Exclusion</td>
</tr>
<tr>
<td>-----------------</td>
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<td>-----------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Oslin, et al.</td>
<td>2006</td>
<td>M/F</td>
<td>65 +</td>
<td>Men: &gt;14</td>
<td>4 or more drinks in the same session, 4 or more times, during the past 3 months</td>
<td>SMAST-G</td>
<td>7 or more drinks with concurrent benzodiazepine or opioid use</td>
<td>Patients with psychosis, mania, or hypomania</td>
</tr>
<tr>
<td>Schonfeld, et al.</td>
<td>2010</td>
<td>M/F</td>
<td>50 +</td>
<td>N/A</td>
<td>Any days drinking over 3</td>
<td>AUDIT-C &amp; SMAST-G</td>
<td>SMAST-G score of 2 or higher</td>
<td>No specific exclusion criteria mentioned</td>
</tr>
<tr>
<td>Schonfeld, et al.</td>
<td>2015</td>
<td>M/F</td>
<td>55 +</td>
<td>&gt;_7</td>
<td>Any days drinking over 3</td>
<td>ASSIST</td>
<td>Included Spanish</td>
<td>No specific exclusion criteria mentioned</td>
</tr>
</tbody>
</table>
Of the studies that examined drinks per week, 72.7% of studies found significant differences between groups. Of the four studies that did not find significant differences, one had group size that were too small (Gordon, et al., 2003) and two other studies had comparison groups which included some other form of intervention (Gottlieb Hasin, 2011; Oslin, et al., 2006).

_Binge Drinking Days_

Binge drinking was examined by $N=9$ of the studies included in the review. The definition of binge and heavy drinking varied across the studies, with some defining it as heavy episodic drinking. Studies set cutoff limits for binge drinking ranging from 3 to 5 drinks in a session, with only 2 studies setting different binge drinking levels for men and women. Of the $N=7$ studies that examined binge drinking changes, 85.7% showed significantly positive results from the intervention, with the only study not showing a significant difference utilizing an enhanced referral comparison group (Oslin, et al., 2006).

_Changes in Drinking Risks_

Multiple studies ($N=5$) examined how brief interventions affect alcohol risk classification. Fink et al. (2005) found that both types of brief interventions that were studied (patient report & combined patient-doctor report) showed significantly greater odds of reducing their alcohol risk classification as scored by the Computerized Alcohol-Related Problems Survey (CARPS). Also, in both Ettner et al. (2004), Moore et al. (2011), and Kuerbis et al. (2015), the intervention groups had significantly lower alcohol risks as measured by the Comorbidity Alcohol Risk Evaluation Tool (CARET). Oslin et al. (2003) also had an outcome measure of at-risk drinking, but it was defined by number of drinks and therefore was included in the frequency section.
Healthcare Utilization

A total of $N=3$ studies examined the way brief alcohol interventions affected client’s healthcare utilization. In Lee and colleagues (2009) study, individuals receiving BIs were significantly more likely to receive health services than the control group, with the treatment group also receiving health services faster than the control. In Ettner et al. (2004), intervention groups visited a physician and visited the emergency room significantly fewer times than control groups. Additionally, intervention groups were hospitalized at lower rates than control groups, but the difference for the latter was not large enough to be significant. Fleming and colleagues (1999) also examined healthcare utilization but there were too small of cell numbers to do proper testing.

Other

Fleming and colleagues (1999) found no significant difference between intervention and control groups among tobacco use or the incidents of accidents and injuries. Ettner et al. (2004) also examined alcohol discussions and found that intervention groups had significantly more discussions with their physicians than control groups, as well as a significantly less chance of having consumed alcohol alongside medications. Schonfeld et al. (2010), although not a RCT, found a significant reduction in SAMST-G scores of participants. Kuerbis and colleagues (2015) found that 56% of participants were labeled as risky drinkers due to alcohol-interactive medication use, however no significant difference in this type of risk was observed three months following the intervention.

Setting and Provider

Of the 13 studies included in the review, only 5 had interventions conducted primarily outside of a physician's office or health clinic, with 1 being conducted via mail, 1 via telephone,
85

1 via online program, and 2 in participant’s homes. Eight of the studies involved interventions conducted entirely by people other than physicians, with 3 studies specifically mentioning social workers as interventionists.

**Consistent Gaps and Limitations**

Across all of the studies there were a number of gaps and limitations resulting from inclusion and exclusion criteria that are of concern. A large majority of the studies excluded participants on the basis of cognitive impairment. Because of this, there is a large gap in the understanding of brief interventions for a sizable portion of the older adult population (Verhaeghen & Salthouse, 1997). Additionally, because alcohol is likely to both mimic and increase the effects of cognitive impairment in older adults, it is likely that these studies have excluded many potential participants who were in need of treatment (Kist, Sandjojo, Kok, & van den Berg, 2014; Blow, 1998). Although a slightly increased effort is required in screening older adults with cognitive impairment, the difficulty of doing so is likely largely overestimated (Randall, Wadd, Edwards, & Thake, 2015).

Another concern common among all of the studies in the review was the terminal follow-up length. Only around half of the studies found extended their follow-up time frame to a full year, with none extending beyond that point. Because of this, virtually nothing is known regarding the effectiveness of older adult brief interventions beyond a year. Finally, only two of the studies in the review mentioned including Spanish options for their interventions, and none looked at specific outcome variations among demographics, which means little is known regarding the cross-cultural validity of older adult brief interventions.
Meta-Analysis

**True Control Comparison**

In order to ensure homogeneity of studies, the first meta-analysis included only studies that had a true control group as a comparison and also had drinks per week as an outcome measure. This resulted in a sample size of $N=4$ studies with $n=886$ total participants at 3-month follow-up and $N=2$ studies with $n=776$ participants at 12-month follow-up. At 3 months, brief interventions had a significant effect on mean drinks per week ($Z=2.74$, $p < .01$) with a combined effect size of -0.34 (-0.59, -0.10). See Figure 4.1 for more details. At 12 months, interventions were not shown to have a significant effect ($Z=1.56$, $p > .05$), but had an effect size of -0.38 (-0.86, 0.10). See Figure 4.2 for more details.

**Alternate Treatment Comparison**

The remaining studies that qualified for meta-analysis had a comparison group that included some other form of treatment, therefore no significant difference between the intervention and comparison was a positive outcome. $N=3$ studies were included in this analysis with a total participant sample size of $n=1,250$. The meta-analysis showed that there was no significant difference between brief interventions and other types of substance use treatment ($Z = 0.54$, $p > 0.5$), with an overall effect size of -0.03 (-0.14, 0.08). See Figure 4.3 for more details.
Figure 4.2: 3-Month Meta-Analysis

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Total</th>
<th>Control Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>IV, Random, 95% CI</th>
<th>Std. Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flemming, 1999</td>
<td>9.31</td>
<td>6.5</td>
<td>78</td>
<td>15.51</td>
<td>11.37</td>
<td>67</td>
<td>26.7%</td>
<td>-0.68 [-1.02, -0.34]</td>
<td></td>
</tr>
<tr>
<td>Kuerbis, 2015</td>
<td>12.1</td>
<td>7</td>
<td>38</td>
<td>13.5</td>
<td>6</td>
<td>41</td>
<td>19.5%</td>
<td>-0.21 [-0.66, 0.23]</td>
<td></td>
</tr>
<tr>
<td>Moore, 2011</td>
<td>8.93</td>
<td>7.3</td>
<td>310</td>
<td>10.73</td>
<td>8</td>
<td>321</td>
<td>44.0%</td>
<td>-0.23 [-0.39, -0.08]</td>
<td></td>
</tr>
<tr>
<td>Oslin, 2003</td>
<td>17.4</td>
<td>12.3</td>
<td>16</td>
<td>20.5</td>
<td>22.5</td>
<td>15</td>
<td>9.8%</td>
<td>-0.17 [-0.87, 0.54]</td>
<td></td>
</tr>
</tbody>
</table>

**Total (95% CI):** 442

Heterogeneity: $\tau^2 = 0.03$; $\chi^2 = 5.85$, df = 3 ($P = 0.12$); $I^2 = 49$

Test for overall effect: $Z = 2.74$ ($P = 0.006$)

Figure 4.3: 12-Month Meta-Analysis

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Total</th>
<th>Control Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>IV, Random, 95% CI</th>
<th>Std. Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flemming, 1999</td>
<td>9.92</td>
<td>6.97</td>
<td>78</td>
<td>16.27</td>
<td>12.17</td>
<td>67</td>
<td>45.2%</td>
<td>-0.65 [-0.98, -0.31]</td>
<td></td>
</tr>
<tr>
<td>Moore, 2011</td>
<td>9.39</td>
<td>8</td>
<td>310</td>
<td>10.7</td>
<td>8.4</td>
<td>321</td>
<td>54.8%</td>
<td>-0.16 [-0.32, -0.00]</td>
<td></td>
</tr>
</tbody>
</table>

**Total (95% CI):** 388

Heterogeneity: $\tau^2 = 0.10$; $\chi^2 = 6.75$, df = 1 ($P = 0.009$); $I^2 = 85$

Test for overall effect: $Z = 1.56$ ($P = 0.12$)
<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental</th>
<th>Control</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
</tr>
<tr>
<td>Hansen</td>
<td>14.1</td>
<td>10.38</td>
<td>342</td>
</tr>
<tr>
<td>Lee, 2009</td>
<td>7.1</td>
<td>8.1</td>
<td>13</td>
</tr>
<tr>
<td>Oslin, 2006</td>
<td>11.8</td>
<td>11.8</td>
<td>280</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>635</strong></td>
<td><strong>615</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.00; Chi² = 2.04, df = 2 (P = 0.36); I² = 2%
Test for overall effect: Z = 0.54 (P = 0.59).

Figure 4.4: Enhanced Referral 6-Month Meta-Analysis
Discussion

Results from this review suggest that brief interventions are significantly effective at reducing the drinking levels and drinking risks for older adults with alcohol problems. With the increase in population size and treatment need for older adults in America, understanding the efficacy of an intervention as affordable in both cost and time as brief interventions is needed to ensure its cross-validity and provide evidence for its wider implementation. The meta-analysis of homogeneous studies show that brief interventions have a moderate effect on reducing older adults’ levels of alcohol consumption at 3-month follow-up, however the small number of available studies for the meta-analysis leaves the outcome questionable. Additionally, the meta-analysis of 12-month follow-up showed no significant difference between control and intervention groups, however again the small sample size of available studies leaves these results inconclusive. When examining the effectiveness of brief interventions to other treatment forms, there was no significant difference between BI and enhanced referrals (meaning control groups were referred to specialized substance use treatment services). These results suggest that BIs may provide a cheaper alternative to traditional treatment services for older adults, with one such study showing that even interventions as simple as educational pamphlets given to at-risk drinkers provide potential benefits (Gottlieb Hansen, et al., 2011), but a further study examining this form of low-intensity-BI against a control group would need to be conducted.

Although the majority of brief interventions in the past have involved a healthcare setting, the increased need of services that have been predicted for this growing population will require its application in other social services sites. Studies included in this review show promising potential for BIs given outside of healthcare settings, with positive results found in
online, mail, telephone, and in-house settings. However, the pool of available studies examining this variable in older adult BIs is small (N=5) and more research is needed.

Setting of interventions is not the only variable needed to be examined to understand which ways the availability of BIs can be expanded. Additionally, it is important to know how older adults respond to BIs delivered by different providers. As mentioned, the majority of older adults receive BIs from their PCP, but to meet the larger demand of a growing population, additional providers of BIs will be necessary. One profession in particular that is in an ideal place to pick up the burden is social work. Practitioners across all fields of social work come into contact with older adults through their various agencies and with relatively simple training may provide a large pool of brief intervention providers. Many studies included in this review had successful interventions conducted by social workers and health educators (Fink, et al., 2005; Lee, et al., 2009; Moore, et al., 2011), though some of these were still conducted in healthcare settings.

Previous studies have shown the effectiveness of SBIRT training in increasing social work student’s feelings of preparedness for working with substance using clients as well as increasing their confidence in assessing alcohol misuse and intervening (Osborne & Benner, 2012; Senreich, Ogden, & Greenberg, 2017). Additionally, SBIRT curriculum have been suggested for integrating its practices into social work education (Bliss & Pecukonis, 2009). Follow-up studies showed that for many service areas, such as mental health and substance use, social work students went on to utilize SBIRT in their practice. However, social workers in geriatric agencies had some of the lowest usage rates of SBIRT, with just 27% of students using SBIRT in their clinical setting (Senreich, et al., 2017). Reasons given as barriers to implementing SBIRT included being afraid they would annoy or offend clients, which may be a stronger
barrier for people working with older adults. In the future, more studies examining the effectiveness of BIs and SBIRT by social workers in social work agency settings will be needed to ensure the validity of both setting and provider.

**Limitations**

The primary limitation to the findings of this study is the use of a single author in the conducting of the review, however this aspect was necessary to fulfill the requirements of a dissertation. In the future, effort will be made to replicate the findings of this study using additional researchers. Another limitation to the reliability of this study were the small number of high-quality RCTs found. Although the meta-analysis showed positive results on brief interventions’ ability to reduce drinking levels, a larger sample of studies examining a broader range of follow-up times and demographic groups is needed to better understand the impact of brief intervention on older adult problem drinking. Additionally, around 38.5% of the studies included in this review and 33.3% of studies in the meta-analysis received a quality rating of poor.

**Implication and Conclusion**

Although there are only a few supporting studies, results from this review suggest that brief interventions are effective at reducing drinking levels and alcohol-related risks among older adult problem drinkers. With a rapidly growing number of older adults in need of all levels of interventions in the future, understanding the effectiveness of brief interventions across settings and providers will be necessary in ensuring healthy aging and the best outcomes for older adult problem drinkers. To acquire this level of evidence, future research must focus on implementing high quality random control trials among numerous types of social service locations and providers with diverse samples. Additionally, studies must also examine the effectiveness of
brief interventions among other types of substances that are experiencing growing rates in the older adult population, including marijuana, cocaine, and prescription drugs.
Chapter 5: Conclusion

Although “the invisible epidemic” has been discussed for decades, the individuals in the generation known as the “baby boomers” have now aged past 50 years old, and still little has been done to address the dramatic increase in substance use and treatment need facing older adults in America. The Institute of Medicine has warned that sufficient level of care is already difficult to provide to the current population of older adults, and that the ongoing population boom in this age group is likely to deeply stress “an already overburdened” system, both in terms of financial resources but also with healthcare workers lacking the necessary education and training (Institute of Medicine, 2008).

Current research has shown that older adults are less likely to be screened or perceive a need for treatment, yet their treatment need is rapidly rising. A potential solution to this problem is spreading out the service burden that increased older adult substance use will incur. This dissertation has attempted to add to the body of research by examining ongoing trends in older adult substance use, expanding the knowledge regarding the negative effects of older adult substance use on social health, and reviewing the validity of current treatment options and their viability in new settings.

Summary and Interpretation of Findings

As stated prior, the purpose of these three studies was to construct a cohesive research narrative of the growing need, outcomes, and solutions for the older adult substance user in America. The changes occurring among substance use in older adulthood is creating a new paradigm in which we must operate under, including prevention, recognition, and treatment,
since for most of modern history older adults have not been considered potential substance users. Results from this dissertation provide a more recent snapshot of substance use in this age group, along with new considerations for how alcohol use may impact social health and an evaluation of current treatment efficacy.

**Substance Use Trends**

Adults over 50 in the National Study on Drug Use and Health have shown a consistent upwards trend in percentage of use in the past month, as well as number of days used, for every substance that was examined in this study, including: alcohol, marijuana, cocaine, and prescription drugs. Not only can an upwards use trend be observed, but use rates for marijuana and prescription drugs in 2015 have already outpaced rates predicted for 2020, meaning the severity of the problem may be even worse than researchers have thought. Even though it is unclear whether future cohorts beyond the baby boomers will continue this increased substance use trend, the sheer number of individuals in the upcoming older adult age group with a substance use treatment need warrants extensive effort into screening and treatment, as well as general education regarding use guidelines and health outcomes.

**Loneliness and Social Support**

Alcohol and loneliness in older adulthood are both sources of misunderstandings and assumptions, and their combined relationship is likely more complex and poorly understood. Recent studies from Canham and colleagues (2015; 2016) have examined the relationship between loneliness and both frequency of drinking and binge drinking and have found that older adults who drink more frequently have lower feelings of loneliness. However, this study attempted to examine the effect over time of alcohol on loneliness and social support among older adults who drink at problem levels. The SEM model used in this dissertation found that
while controlling for depression, and wave 1 loneliness and support, problem drinkers felt lonelier and less supported 5 years later.

Comparing these results to Canham’s may provide further insight into the nature of alcohol and loneliness in older adulthood. Although these studies seem at first contradictory, it’s possible they are examining different aspects of the relationship. For instance, a model for drinking has been validated that breaks down drinking motivations into three factors: coping, socialization, and enhancement (Cooper, Russell, Skinner, & Windle, 1992). Because Canham’s study examined the frequency of drinking, and not problem drinking, their sample may primarily have been consuming alcohol for socialization and enhancement. Following this reasoning, older adults who drink frequently at moderate levels also engage more socially, thereby being associated with lower feelings of loneliness.

Instead of social and enhancement motivations, problem drinkers are more likely to be doing so for coping. A recent study examining the differences in motivation for older adult problem drinkers and non-problem drinkers found that problem drinkers were significantly more likely to consume alcohol for coping reasons over social and enhancement reasons (Gilson, Bryant, & Judd, 2017). This includes consuming alcohol in order to manage physical health symptoms (such as pain), to forget worries, to cheer up, and to reduce feelings of depression. Because quality of health, depression, and anxiety are all related to loneliness, it is likely for there to be a positive relationship between problem drinking and loneliness (meaning problem drinkers feel lonelier), while at the same time a negative relationship between non-problem drinking and loneliness. Results from this dissertation go further and suggest a longitudinal relationship may exist whereby problem drinkers increase their feelings of loneliness and reduce their feelings of social support over time.
**Older Adult Brief Interventions**

Finally, this dissertation also provided one of the first scoping reviews and meta-analyses of older adult brief interventions and their efficacy in reducing alcohol consumption and risks. Although the study has been limited so far by its use of a single author, its findings suggest a narrow body of research and RCTs examining brief interventions among older adult samples, with an even fewer number of high quality studies. Even so, the available data shows a moderate effect size in the ability of brief interventions to reduce the amount of alcohol older adults consume, as well as their overall alcohol-related risks. The low cost of brief interventions, both in terms of money and time, make brief interventions an integral part in helping to alleviate the growing treatment burden of older adult substance users, especially those with mild to moderate use problems.

Another aim of this review was to examine the current body of evidence for the implementation of brief interventions outside of healthcare settings and administered by people other than nurses and physicians. The ability for alternative brief intervention providers, such as individuals working in social service fields, may be an important factor in being able to adequately address the increased treatment need of older adult substance users. Although few studies existed outside of healthcare settings, positive results from both online, mailed, and educational pamphlets suggest the future viability of a variety of brief intervention settings.

**Implications and Future Direction**

There is much to be done to prepare America’s health and social service system, along with its general population, for the changes in older adult substance use. Because older adults remain the least likely group of people to be screened or perceive a need for treatment (Choi, DiNitto, & Marti, 2014; Duru, et al., 2010), the large increase in substance use and treatment
need implies the necessity for an equal increase in resolve to address these issues. With the changing demographics and substance use patterns among older adults in America, the results from this study provide perspectives to pertinent problems that have long been foretold.

As Chapter 2 of this dissertation has indicated, it is likely that substance use rates for alcohol, marijuana, and prescription drugs will outpace projections made only 10 years prior. What is still largely unknown however is the differences in the perception of the need for treatment and motivation to change between prior and incoming cohorts of older adults. Although older adults have been shown to have equal and sometimes better treatment outcomes than younger age groups, these studies have largely been done examining cohorts of older adults that have excluded the baby boomer cohort. With this generation growing up with a large difference in drug culture and acceptance, it is possible their perceptions and outlook regarding the need for treatment may differ. Therefore, future studies examining the effectiveness of different treatment programs should likely not group everyone 50 and over into one group, but instead examine the effectiveness of treatments among subsets of older adults, similar to how studies divide younger samples into multiple age groups.

The largest growth in substance use rates among adults 50 and over in the NSDUH were with marijuana and prescription drugs. Unlike alcohol, which has been understood to be abused by older adults in the past and has had a large amount of research into the health impacts of use in older age, there has been less research regarding the health impacts of marijuana and NMPDU. Due to many factors, including a growing legalization movement in America, a larger history of use, increased leisure time and expendable income, it is likely that marijuana use among older adults will continue to rise. This means a concerted effort into understanding the
physical and social effects of all levels and forms of marijuana use in older adulthood will be needed to ensure healthy aging for this new group of older adults.

Additionally, in order to make sure the increased treatment need is met, future studies examining the preparedness and effectiveness of a variety of screening and brief intervention providers must be conducted. As mentioned prior, social workers are in an ideal position to help alleviate the burden and widen the screening net for older adult substance users, yet little is known regarding their current ability and efficacy regarding screening and brief interventions. A future study likely to follow this dissertation will be a survey of social workers so that their current levels of understanding and competency can be understood in order to make sure the profession is ready to assume this needed role. Following this assessment, another future study examining the efficacy of brief interventions for older adults performed by social workers will be needed. As shown by the scoping review in this dissertation, there is a lack of high quality RCTs that have examined the efficacy of older adult brief interventions, and none that have specifically looked at validating their use in social work settings.

Another area that can be focused on to increase the success of older adults seeking and completing treatment is educational efforts. Although the NIAAA have specific guidelines for alcohol use in older adulthood, little is known regarding how well both older adults and general social service providers are aware of these guidelines. By integrating educational pamphlets to all clients, regardless of their screening status, awareness of the issue can spread and help to reduce potential stigma and incite people with a potential problem to recognize their unhealthy use and seek treatment.

Finally, results from this dissertation have indicated a potential benefit of integrating specific attention to loneliness and social support into older adult treatment programs. Because
problem drinkers are likely to have increased feelings of loneliness and decreased feelings of social support over time, which in turn have their own negative impacts on health and treatment outcomes, a more holistic approach to older adult treatment that incorporates a greater focus on peer support and loneliness reduction efforts may lead to better health and treatment outcomes. Further studies are needed examining whether treatment programs and curriculums that include attention to loneliness and social support needs result in better outcomes for older adult substance users. Additionally, a future beneficial study could be designed to examine whether problem drinkers with high feelings of loneliness and low feelings of support see positive results on these social outcomes when alcohol problems are addressed.
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